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Nurse Perceptions of Influenza Vaccination

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NURSE PERCEPTIONS OF INFLUENZA VACCINATION

A Major Paper Presented

By

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Abstract

The purpose of this research study was to determine the perceptions of influenza vaccine of registered nurses who decline the annual influenza vaccination. Influenza is a serious public health issue because it is a highly contagious virus that is associated with considerable morbidity and mortality. The topic of making annual influenza vaccinations mandatory for health care workers remains controversial. A comprehensive review of the literature surrounding influenza vaccinations was explored and discussed. The data for this study was obtained via anonymous voluntary surveys with one open-ended and 14 closed-ended questions. A mixed method design was used to analyze the voluntary responses from acute and critical care registered nurses employed at Rhode Island Hospital and Hasbro Children's Hospital who declined the influenza vaccination during the 2013-2014 influenza season. The results were examined and disseminated to provide insight and possibly modify future educational campaigns to promote increased annual influenza vaccination rates among registered nurses and health care workers overall. APRNs have the opportunity to serve as leaders by advocating for annual vaccinations, providing evidence based education, and supporting policy changes to positively impact patient outcomes, institutions, communities, and overall population health.

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Nurse Perceptions of Influenza Vaccination

Statement of Problem

Influenza has been a threat to population health and has “played an important role in the history of medicine and disease” (Saluja, Theakston, & Kaczorowski, 2005, p. 18). Influenza is a highly infectious viral illness that originated in 15th century Italy from an epidemic named “influenza” or influence of the stars. Influenza is a single-stranded RNA virus with either antigen types A, B, or C. The type is determined by the surface antigens hemagglutinin (H) and neuraminidase (N). These antigens experience major change or antigenic shifts every 10 to 40 years resulting in pandemics because the population does not have protective antibodies against these new antigens. The first influenza pandemic occurred in 1580 and there were at least four documented pandemics in the 19th century and three in the 20th century. The first pandemic of the 21st century was in 2009-2010 due to the H1N1 outbreak (Atkinson, Wolfe, & Hamborsky, 2012). The World Health Organization (WHO) estimates the global attack rate for influenza to be 5-10% for adults and 20-30% for children. Seasonal influenza results in 3 to 5 million cases of illness and 250,000-500,000 deaths annually (World Health Organization, 2014). “The annual morbidity and mortality caused by influenza is a serious public health issue” (Ottenberg et al., 2011, p. 212). Influenza is the most common vaccine-preventable disease (Backer, 2006). “Influenza and influenza related complications kill more people than all other vaccine-preventable diseases combined” (“ANA Urges Registered Nurses,” 2010, para. 3). The WHO maintains that vaccination is the most effective way to prevent seasonal influenza and reduce disease burden. “Safe and effective vaccines are available and have been used for more than 60 years” (World Health Organization, 2014, para. 6).

The Centers for Disease Control and Prevention (CDC) and the Advisory Committee on Immunization Practices (ACIP), recommend annual influenza vaccination for everyone 6 months of age and older (CDC, 2013f). Vaccination is especially imperative for individuals who are at high risk for serious complications related to influenza illness, their family or caregivers, as well as health care workers (World Health Organization, 2014). Nosocomial influenza transmission results in longer patient stays, interruptions in health care delivery, increased absenteeism, and inpatient death (Ottenberg et al., 2011). Avoiding harm to patients dates back to the Hippocratic Corpus over 2300 years ago. Vaccinating health care workers against seasonal influenza is a safe and simple tool to reduce absenteeism, reduced health care associated influenza, and prevent patient mortality (Pavia, 2010). Despite known risks of influenza to vulnerable patients, vaccination coverage among United States health care workers remains near 50% (Ottenberg et al., 2011).

The ACIP recommended influenza vaccination of healthcare workers beginning in 1984 but national rates have remained low. Vaccination is also endorsed by the Society for Healthcare Epidemiology, the Association for Professionals in Infection Control, and the Infectious Disease Society of America (Babcock, Gemeinhart, Jones, Dunagan, & Woeltje, 2010). The 2009 H1N1 public health emergency has led to discussions as to whether voluntary influenza vaccination programs are adequate to protect patient safety. Voluntary programs over three decades have failed to achieve acceptable vaccination rates. According to Healthy People 2020, the goal is to increase the percentage of health care personnel who are vaccinated annually against seasonal

influenza to 90% through consistency with national programs, regulations, policies, and laws (Healthy People 2020 website, 2013).

Vaccination Statistics

Although annual influenza vaccination has been recommended for health care workers to reduce morbidity associated with influenza in health care settings, only 61.9% of United States health care workers were vaccinated in 2009-2010 and 63.5% during the 2010-2011 influenza season. It was noted that 98.1% had the vaccination if it was an employer requirement. Increased rates were noted if the employer offered free vaccines onsite and on multiple days ("Influenza Vaccination Coverage," 2011). According to the CDC, influenza vaccine coverage was similar for physicians and dentists at 84.2% as well as for nurse practitioners and physician assistants at 82.6%. Registered nurses were noted to have a 69.8% vaccination rate ("Influenza Vaccination Coverage," 2011, table 1). The purpose of this research was to determine the perceptions of influenza vaccination of registered nurses who declined the influenza vaccination during the 2013-2014 influenza seasons.

Literature Review

A comprehensive review of relevant literature from 2005-2013 was conducted using CINAHL and Medline databases. Keywords included influenza, influenza vaccination, mandatory influenza vaccination, health care workers, registered nurses, and nurses. Articles written in languages other than English were excluded.

Mandatory Influenza Vaccination Programs

One of the first mandatory influenza vaccination campaigns was implemented at Virginia Mason Medical Center in Seattle, Washington. Only 54% of employees received the influenza vaccination in 2003-2004 and only 29.5% received the vaccination during the following year partly due to a national vaccine shortage. The mandatory influenza vaccination campaign began in 2005 led by a multidisciplinary task force and with approval from the chief executive officer and the board of trustees. The campaign began in the summer and included an informational web site with links to outside sources, grand rounds speakers, influenza “champions”, fun flu quizzes, and a vaccine kickoff party with members of the local professional football team. Health care workers were offered multiple types of the influenza vaccine including thimerosal-preserved injectable, thimerosal-free injectable, and live, attenuated nasal vaccine. Health care workers with a history of an egg or vaccine allergy were offered skin tests and vaccinations in the allergy laboratory at no cost. Health care workers were allowed to apply for an accommodation due to medical or religious reasons and a standardized form was used. If granted an accommodation, the health care worker was required to sign an agreement to wear a surgical mask while at work. Out of approximately 5000 health care workers, 97.6% were vaccinated, 31 were granted an accommodation due to medical or

religious reasons, 5 employees voluntarily left, and 2 were terminated for refusal to comply with the policy. The policy remains in effect and vaccination rates have remained above 97.5%. Inpatient nurses, who were the only unionized employees at Virginia Mason Medical Center and belonged to the Washington State Nurses Union, filed a grievance because the new requirement had not been negotiated as part of the collective bargaining agreement. As a result, inpatient nurses who were unionized were not required to be vaccinated. Despite this decision, 85.9% of the 599 unionized inpatient nurses chose to be vaccinated. When implementing a mandatory program, resistance from unions and possible litigation must be considered. The authors speculated that in the future, healthcare institution vaccination rates may be made publicly available and this may result in increased vaccination rates because patients may choose their health care institution based on this information (Rakita, Hagar, Crome, & Lammert, 2010).

Another mandatory vaccination program included Barnes-Jewish Christian (BJC) Health care, a large mid-western organization with over 26,000 employees. BJC added influenza vaccination rates to their 2007 safety and quality scorecard used at all hospitals in their organization, however vaccination rates remained below the goal of 80%. In 2008, they implemented a mandatory influenza vaccination policy for all employees. As a patient safety initiative, influenza vaccination was made a condition of employment. The mandatory policy was communicated to employees through the BJC intranet site, clinical managers, standardized educational materials and fact sheets, letters mailed to the employee's homes, articles in the BJC Today in-house newspaper, as well as through Town Hall Meetings where infectious disease physicians and occupational health nurses were available for concerns or questions. Of 25,980 employees, 25,561 complied with

the policy and were vaccinated, 321 were granted medical exemptions, and 90 were offered religious accommodations. This resulted in a 99.96% vaccination rate and only 8 employees were terminated (0.03%) for noncompliance with the policy. The mandatory vaccination program successfully increased rates at this large multihospital health care organization (Babcock et al., 2010).

This article is important regarding influenza vaccinations because it reports on one of the first successful mandatory policies. This policy also noted that employees who were granted an exemption were encouraged to wear an isolation mask while providing direct patient care, but no specific enforcement was implemented (Babcock et al., 2010). The authors concluded that the mandatory program markedly increased vaccination rates and recommended a standardized declination form with accepted contraindications and their definitions. The authors also note that the study may not be generalizable to other organizations and that economic factors may have limited the number of employees willing to lose their jobs that year (Babcock et al., 2010). This study was groundbreaking in that it was the first large health care organization to implement such a policy and it demonstrated a 99.96% successful vaccination rate.

Loyola University Medical Center (LUMC) made influenza vaccinations mandatory for all health care workers in 2009. The facility also required all hospital staff, students, and volunteers be vaccinated as well. Prior to the mandate the average vaccination rate was 65%. After implementation of the mandate, the rate was close to 99% with the remaining being exempted for medical or religious reasons. LUMC also requires a letter from the exempt health care worker's physician or religious leader. The letter must also include a contact number for the facility to call if the exemption needs to

be further discussed. Before this stringent measure was required, many health care workers used egg allergy as a reason not to get vaccinated even if there was no evidence of a true allergy. Since the mandate, there has been reduced influenza related absenteeism among staff but LUMC has not tracked whether the mandate has resulted in better patient outcomes (Lowry, 2013). This article demonstrates another successful implementation of a mandatory vaccination program for health care workers and notes that if all facilities in the community have the same mandatory policies then the motivation of all health care workers to get vaccinated will increase.

Since the 2009-2010 H1N1 pandemic, many state governments and health care facilities have considered implementing mandatory influenza vaccination requirements. The Rhode Island Department of Health (RIDOH) implemented a mandatory policy in 2012 (R 23-17-HCW), requiring annual influenza vaccination for all health care personnel. The policy required facilities to have a plan to provide annual influenza vaccination in a timely manner and at no cost to the health care worker. Per the policy, each facility must also maintain a surveillance program to track and record influenza vaccination and report to the RIDOH, the number of health care workers eligible for the vaccine and the number of health care workers who receive or decline for medical reasons. Health care workers who did not receive the influenza vaccination were required to wear a surgical facemask for all direct patient contact once the Director of Health declares flu to be widespread (Rhode Island Department of Health, 2014). The health care workers who declined were required to submit a signed influenza vaccination declination form to their employer by December 15. The form acknowledged that the health care worker must wear a surgical facemask for all patient contact during periods of

widespread flu and if found to be in violation of the policy, a fine of \$100 could be levied for each occurrence. In addition to a fine, the individual health care worker could be subject to a complaint of professional conduct that would be reported to the professional licensing board for disciplinary action. The policy was in effect from December 5, 2012 through February 11, 2013. This was the first influenza vaccination mandate in Rhode Island and the same policy was also implemented for the 2013-2014 influenza season. The purpose of the regulation was to protect the public as a whole and in particular, those most vulnerable to influenza due to immunosuppression and other medical conditions (Rhode Island Department of Health, 2012).

Arguments Against Mandatory Influenza Vaccinations

The American Nurses Association (ANA) states “as the most trusted profession, we owe it to ourselves, our patients, and the public to be vaccinated and set the example we want the nation to follow” (“ANA Urges Registered Nurses,” 2010, p. 2). Although the ANA strongly encourages annual influenza vaccination, the association does not support mandatory policies. The ANA believes protecting the rights of nurses is paramount and therefore does not support mandatory policies unless they are fair, equitable, and nondiscriminatory. The ANA feels mandatory policies should only be implemented if: the state government initiates the mandate, the vaccinations are free and available at convenient times and locations, the policy is part of a comprehensive infection control program, individual nurses will not be discriminated against, and employers will negotiate with worker unions to resolve any differences once a mandatory policy is initiated (“ANA Urges Registered Nurses,” 2010). The Rhode Island Department of Health initiated a statewide influenza vaccination mandate in 2012 (R 23-

17-HCW) (Rhode Island Department of Health, 2012). Rhode Island is one of few states to implement a statewide mandate.

Furthermore, a commentary in *Clinical Infectious Disease* presented several arguments against mandatory vaccination. The commentary notes that well-organized fully funded facility-based vaccination programs are just as effective as mandatory policies. True mandatory policies would have an element of coercion and a detrimental effect on the relationship between workers and those carrying out the mandate.

Voluntary programs conversely can strengthen working relationships by placing the focus on the common purpose of protecting patients while maintaining mutual respect.

Another deterrent to mandatory vaccinations is the potential for legal challenges and potential infringement of employees' civil liberties. Although mandating influenza vaccination might increase rates to 85-90%, it may not be worth the conflict and legal matters that may result (Finch, 2006). Although this article raises appropriate concerns, the fact that most mandatory programs do offer exemptions should alleviate the need for legal action. This article was also written prior to the H1N1 pandemic in 2009-2010 and prior to the implementation and success of the previously discussed mandatory programs.

Ethical considerations

Anikeeva, Braunack-Mayer, and Rogers discussed ethical arguments for and against influenza vaccination of health care personnel. "Compulsory vaccination would meet the ethical requirements of non-maleficence and beneficence" (2009, p. 27). Ethical arguments against compulsion would be centered on the rights of health care workers and autonomy. Mandatory policies may be seen as "coercive and invasive especially if linked to sanctions such as loss of employment" (Anikeeva et al., 2009, p. 27). There is also the

possibility of legal consequences or liability in the event of serious side effects. The authors surmised that the best option would be a vaccination program with incentives and sanctions. This approach would increase health care worker compliance with fewer ethical impediments than a mandatory policy (Anikeeva et al., 2009).

Barriers to Vaccination

An integrative review by Toronto and Mullaney, analyzed international research published between 2003 and 2009 and explored factors that influenced nurses' decisions to receive or decline influenza vaccination. It was noted that if nurses accepted the vaccination it was because they had a perceived benefit to protect themselves and their patients. If nurses did not believe they were at risk or they did not believe they had perceived susceptibility, they generally chose not to be vaccinated. It was also found that the nurses who were vaccinated in the past perceived influenza as a serious illness as compared to nurses who were never vaccinated. Nurses who had received the vaccine during the previous influenza season were more likely to receive the influenza vaccine again. Receiving the vaccine strongly correlated with future vaccine acceptance. Nurses who declined the influenza vaccine believed they were not at risk for influenza and believed they had a strong immune system built from workplace exposure to the disease. Many nurses who declined perceived they were in good health, young, and not susceptible to influenza. This integrative review confirmed that concerns over vaccine safety and adverse reactions were strongly associated with non-vaccination (Toronto & Mullaney, 2010). Future campaigns should include education on these areas specifically for nurses.

A survey of 928 hospital staff at Johns Hopkins Hospital (JHH) was conducted during the 2008 to 2009 influenza season. The survey was conducted to assess health care worker's understanding of and response to a stringent vaccination policy. In an effort to improve vaccination rates, JHH had implemented a policy in 2006 requiring signed declination forms for all health care workers who declined the influenza vaccination. The policy was changed in 2008 to require surgical masks be worn by health care workers who declined the vaccination. A colored identification badge clip was issued to each staff member who was vaccinated. The badge clip was to help supervisors track unvaccinated staff and enforce the mask requirement. When surveyed, 42% of staff were unaware that there had been an influenza vaccination policy change. The survey found that those who received the vaccine every season were more likely to believe that the vaccine protected them against the flu and prevented the spread of the flu to patients. Health care workers who were inconsistent with receiving the annual vaccine noted that the mask requirement or supervisor or institutional expectations were strong influences on their decision. It was found that this group also believed the policy to be unfair and that external pressures were not likely to change behavior over the long term. Staff who consistently received the influenza vaccine perceived the vaccine to be effective. The study concluded that further studies about the factors influencing health care workers beliefs were needed in order to tailor policies and programs accordingly (Daugherty, Speck, Rand, & Perl, 2011).

Influenza vaccination programs for health care workers are cost-effective in terms of direct medical costs and indirect costs such as staff absenteeism. Even when programs are actively promoted, vaccination rates remain below the 83% to 94% levels needed to

achieve herd immunity (Anikeeva et al., 2009). Low acceptance may be due to attitudinal barriers or the belief that the benefits of receiving the vaccine are not as great as the risks of adverse events. It was found that programs that actively target previously identified barriers to vaccination had the most significant impact on improving staff vaccination rates (Anikeeva et al., 2009). The findings of this study were consistent with the principles of the Health Belief Model.

Theoretical Framework

The study design utilized principles of the Health Belief Model. The model is used in health promoting activities and helps to predict health behavior. The Health Belief Model was originally developed in the 1950's by social psychologists for the U.S. Public Health Service to improve the public's use of preventive services. Failure to take health-protective actions or to comply with medical advice may be due to a lack of motivation. Failure to take action may also be because a person does not believe the occurrence of the condition would seriously upset their lives or they do not believe they will contract the condition if exposed (Rosenstock, Strecher, & Becker, 1988). "In planning programs, many health educators have found it useful to assess educational needs partly in terms of the beliefs described in the Health Belief Model" (Rosenstock et al., 1988, p. 181).

There is a positive relationship between self-efficacy and health behavior change. Programs influencing health practices may be improved though directly targeting the enhancement of self-efficacy (Strecher, DeVellis, Becker, & Rosenstock, 1986). The collection of data on health beliefs and self-efficacy enables the planning of more effective programs than can target interventions to specific needs (Rosenstock et al., 1988). With this theory as a guide, the research survey results will provide insight into registered nurse's perceptions and may assist in modifying future educational campaigns and interventions to foster increased vaccination.

Methodology

Purpose

The purpose of this project was to determine the perceptions of influenza vaccination of registered nurses who declined the influenza vaccination during the 2013-2014 influenza season.

Sample and Site

Study participants were adult and/or pediatric acute and critical care registered nurses employed at Lifespan's Rhode Island Hospital, a 719-bed non-profit teaching hospital and trauma center founded in 1863 and Hasbro Children's Hospital, an 87-bed pediatric hospital and trauma center located in Providence, Rhode Island. The voluntary participants were male or female nurses who declined the influenza vaccine.

Procedures

A 15-question survey (Appendix A) was compiled using questions from Lifespan's influenza declination statement and questions excerpted from the CDC's Morbidity and Mortality Weekly Report website (www.cdc.gov/mmwr). The survey consisted of one open-ended question and 14 closed-ended questions in English. Inpatient nurse managers at Rhode Island Hospital were contacted for permission to invite the nursing staff on their units to participate in a research study to explore nurse perceptions of influenza vaccination. A signed letter of collaboration (Appendix B) to confirm their unit's participation was obtained from nurse managers on the Cooperative Care Unit 2, Bridge 7, Medical Intensive Care Unit, Jane Brown 1 North, Jane Brown 4 North, Main

Building 6A, 6B, 10A, 10B, and Hasbro 5, a pediatric care unit. The managers were given the option to make a formal announcement about the study to their staff.

Institutional Review Board (IRB) approval was obtained from Rhode Island College and Lifespan prior to conducting the survey and both determined the project to be exempt.

The informational letter and research survey was posted after IRB approval in the participating units' break rooms February 4, 2014 through March 1, 2014. An IRB approved stamped informational letter (Appendix C) describing the voluntary and anonymous research study was attached to the survey to delineate the purpose of the research and disclose that there were no known risks or benefits to the participants. Only nurses who declined the influenza vaccination for the 2013-2014 season were eligible to participate. Confidentiality was maintained by keeping the survey anonymous and by each participant sealing the completed survey in a white envelope that was provided. The sealed white envelope was then placed by the participant in a large manila envelope in the break room labeled Completed Surveys. The researcher collected the surveys daily Monday through Friday during the research study period. The completed surveys will be stored in a locked office at Rhode Island Hospital for three years. Participants were considered vulnerable if they were female, if they were older than 65 years of age, and because they were employees of Lifespan. No inquiries were received throughout the process from any of the participants.

Results

A mixed-method design was used to analyze the research data. Basic descriptive statistics were used to analyze the demographic data. The open-ended question was analyzed for common themes. Mean scores and percentages were calculated for the Likert scale survey questions. Demographic characteristics of participants are illustrated in Table 1.

Table 1

Demographic Characteristics of Participants

Survey Question Number	Responses	Percentages
1. Flu Shot Before	Yes: 15 No: 3 No response: 1	78.9% 15.8% 5.3%
2. Age	18-24: 0 25-49: 14 50-64: 5 65+: 0	0% 73.7% 26.3% 0%
3. Sex	#Male: 2 #Female: 17	10.5% 89.5%
5. Education level	Diploma: 0 Associate's: 5 Bachelor's: 12 Master's: 2 Doctoral: 0	0% 26.3% 63.2% 10.5% 0%
6. Direct Patient Contact	Yes: 19 No: 0	100% 0%
7. Years as an RN	0-10: 13 11-20: 2 21-30: 3 31-40: 1 41-50: 0 51+: 0	68.4% 10.5% 15.8% 5.3% 0% 0%

Note. N = 19.

The majority of nurses who responded were female (89.5%), between the ages of 25-49 (73.7%), held a Bachelor's degree (63.2%), have been a nurse for 0-10 years (68.4%), and have had the flu shot before (78.9%). All participants had direct patient

contact (100%). The survey also consisted of eight questions regarding knowledge and beliefs about influenza vaccination with Likert scale response options. The responses ranged between 1-5; strongly disagree to strongly agree with high scores indicating more agreement. Table 2 and Table 3 will delineate the Likert scale survey results, mean scores, and percentages.

Table 2

Frequencies and Mean Scores on Questions 8-15

Survey Question	Strongly Agree=5	Agree=4	Don't Know=3	Disagree=2	Strongly Disagree=1	Mean Scores
8. I would only receive a vaccine if mandated	4	3	3	4	5	2.84
9. I am at risk for getting influenza	5	9	0	4	1	3.68
10. People around me are at risk for getting influenza	6	10	1	2	0	4.05
11. Influenza is a serious threat to my health	4	7	0	7	1	3.31
12. Influenza is a serious threat to the health of people around me	7	9	1	2	0	4.10
13. Influenza vaccine can protect me from getting influenza	2	6	4	6	1	3.10
14. Influenza vaccine is safe	1	6	7	4	1	3.10
15. I know everything I need to know about influenza vaccinations	8	6	3	0	2	3.94

Note. N = 19.

The strongest agreement was noted with question 12: influenza is a serious threat to the health of people around me (mean score = 4.10). Agreement was also inferred from higher mean scores for question 10: people around me are at risk for getting influenza (mean score = 4.05), and question 15: I know everything I need to know about influenza vaccinations (mean score 3.94). The lowest mean score (2.84) was noted for question 8: I would only get a vaccine if mandated. This question had 3 to 5 responses for each choice option indicating that there was less agreement for one particular response. This also demonstrates that not all nurse participants were opposed to mandatory vaccinations.

Table 3

Survey Questions and Response Percentages

Survey Question	Strongly Agree or Agree	Don't Know	Strongly Disagree or Disagree
8. I would only receive a vaccine if mandated	37% (7)	16% (3)	47%(9)
9. I am at risk for getting influenza	74%(14)	0%	26%(5)
10. People around me are at risk for getting influenza	84%(16)	5% (1)	11%(2)
11. Influenza is a serious threat to my health	58%(11)	0%	42%(8)
12. Influenza is a serious threat to the health of people around me	84%(16)	5% (1)	11%(2)
13. Influenza vaccine can protect me from getting influenza	42%(8)	21% (4)	37%(7)
14. Influenza vaccine is safe	37%(7)	37% (7)	26%(5)
15. I know everything I need to know about influenza vaccinations	74%(14)	16% (3)	11%(2)

Note. N = 19.

As noted in Table 3, questions 10 and 12 had the highest consensus with 84% participant nurses strongly agreeing or agreeing that influenza was a risk and health threat to other people. Questions 9 and 15 both had 74% participants strongly agreeing or agreeing that they were personally at risk for influenza and that they knew everything they needed to know about influenza vaccinations. As previously discussed, the lowest mean score (2.84) was for question 8: I would only receive a vaccine if mandated. Thirty-seven percent of the participating nurses strongly agreed or agreed that they would only receive influenza vaccination if mandated. Forty-seven percent strongly disagreed or disagreed and 16% didn't know if they would only receive influenza vaccination if mandated. This question illustrates that although the participants did not receive the influenza vaccination for the 2013-2014 influenza season, all were not opposed to mandatory influenza vaccination. The most equally distributed responses were noted for questions 13 and 14. These questions involved beliefs about vaccine efficacy and safety. Among responses, 58% either didn't know or disagreed that the influenza vaccine was effective and 63% didn't know or disagreed that the influenza vaccine was safe and yet 74% indicated that they knew all they needed to know about influenza vaccination. These may be areas to target for further education.

Question 4 encouraged survey participants to choose one or more of six reasons and/or write in a reason for declining influenza vaccination (Appendix A). Responses to this open-ended question of the survey led to three common themes: declination due to personal health belief, concern about vaccine side effects or ingredients, and declination due to uncertainty about the vaccine's efficacy. None of the respondents refused due to medical reasons. Health beliefs were evident in responses such as "I am healthy and my

life would not be compromised if I contracted the flu”. “I have a great immune system and if I get the flu my body will take care of it”. “I don’t remember the last time I was sick. I don’t have any close friends that have ever had the flu”. “I have never had the flu shot or the flu”. These subjective responses illustrate some of the different health beliefs nurses have and how these beliefs impact decision making and personal health choices. Concern about vaccine side effects or ingredients were evident in responses such as “I have heard that flu vaccines contain heavy metals and am not sure how safe that is”. “I have declined the influenza vaccine due to the research findings on the side effects of flu vaccine”. “The science behind flu vaccines is not exact or empirically sound. I think the vaccine poses risks such as Guillaine-barre”. “No one can tell me if the preservatives in the vaccine are gluten free. I even tried to get info from the drug companies and just got the run around from them with no answer”. Uncertainty about the vaccine’s efficacy was evident in responses such as, “Last year’s vaccine contained a strain of flu that many people contracted anyway in spite of the flu shot. I know what I think. It isn’t proven to me that flu vaccines work as well as other vaccines such as MMR, small pox, or whooping cough. They all seem to actually prevent the illness they are given for”. These responses elucidate the need for future educational campaigns to include information regarding vaccine efficacy, ingredients, and side effects.

Summary and Conclusions

The purpose of this research study was to determine perceptions of influenza vaccination of registered nurses who declined the annual influenza vaccination. Study participants included registered nurses employed at Rhode Island Hospital and Hasbro Children's Hospital who declined the influenza vaccination during the 2013-2014 season. The data for this study was obtained via anonymous voluntary surveys, which included demographic information such as age, sex, education, and number of years as a nurse. The data also included one open-ended and 14 closed-ended questions. The study design was guided by the Health Belief Model (Rosenstock et al., 1988). Results of the survey indicated that although the participants did not receive the influenza vaccination for the 2013-2014 influenza season, all were not opposed to mandatory influenza vaccination. The strongest agreement was with question 12: influenza is a serious threat to the health of people around me (mean score =4.10). Questions 10 and 12 had the highest consensus with 84% participant nurses strongly agreeing or agreeing that influenza was a risk and health threat to other people. Questions 9 and 15 both had 74% participants strongly agreeing or agreeing that they were personally at risk for influenza and that they knew everything they needed to know about influenza vaccinations. Among responses, 58% either didn't know or disagreed that the influenza vaccine was effective and 63% didn't know or disagreed that the influenza vaccine was safe. None of the respondents refused due to medical reasons. The collection of data on health beliefs enables the planning of more effective programs that can target interventions to specific needs (Rosenstock et al., 1988). In order to increase influenza vaccination rates, further education and awareness about vaccine ingredients, side effects, and efficacy are clearly indicated.

The single most effective way to prevent getting influenza is to get the influenza vaccine every year (CDC, 2013a). The H1N1 pandemic in 2009 has renewed increased concern and awareness of influenza and the importance of influenza vaccinations. Increased concern has led to discussion and controversy related to the topic of mandatory influenza vaccinations. The RI DOH implemented a mandatory policy starting in 2012 (R 23-17-HCW), requiring annual influenza vaccination for all health care personnel. Health care workers who declined were required to submit a signed influenza vaccination declination form to their employer by December 15, and were also required wear a facemask during the period of designated influenza outbreak. According to Jacqueline Parrillo, Manager of Lifespan Employee & Occupational Health Services at Rhode Island Hospital, 100% of employees complied with the Influenza Vaccination Policy. Eighty-seven percent of employees received the vaccination, 13% declined, and 0.2% had a medical exemption for the 2013-2014 season. Eighty-six percent of employees received the vaccination for the 2012-2013 season (J. Parrillo, personal communication, February 14, 2014). Statistics specific to vaccination rates of registered nurses at Rhode Island Hospital were not available. Rhode Island Hospital was slightly below Healthy People 2020's goal to have 90% influenza vaccination rate for health care workers.

Studies by the CDC are conducted annually to estimate how well influenza vaccinations have protected against the flu in the United States. The CDC publishes estimates of vaccine effectiveness through data obtained from the Flu Vaccine Effectiveness Network. The CDC and ACIP also publish an annual Morbidity and Mortality Weekly Report (MMWR) with information regarding vaccine strains and any updates in vaccine recommendations (CDC, 2013d). MMWR mid-season estimates were

published on February 21, 2014 (*MMWR*, 2014). Interim estimates for mid-season vaccine effectiveness was a 61% reduction in influenza related medical visits for all age groups and 62% effectiveness against the most common influenza, Flu A (H1N1), for children and adults. The H1N1 virus accounted for 98% of detected flu viruses this season. There were not enough influenza B or influenza A (H3N2) detected to make a mid-season estimate for either of these strains. Interim results indicate that receiving the influenza vaccination reduced the risk for influenza related medical visits by approximately 60%, which clearly illustrates the benefits of receiving the influenza vaccination. Public health experts anticipate vaccine effectiveness during flu seasons to be approximately 60%. This season's estimates demonstrated the substantial public health benefit that the vaccine provided, particularly against H1N1 (CDC, 2014a). According to a report by the CDC (2013b), it was estimated that influenza vaccination prevented 79,000 hospitalizations and 6.6 million illnesses during the 2012-2013 influenza season.

According to survey results, another concern surrounding influenza vaccination is the potential risk of Guillain-Barre syndrome (GBS). This is a rare disorder during which an individual's immune system attacks their nerve cells resulting in muscle weakness or paralysis. It is estimated that 3,000-6,000 people in the United States develop this disorder annually. Anyone can develop GBS but it is more common in adults over 50 years of age. Causes of GBS include a recent viral illness, influenza, or Epstein Barr, as well as a recent respiratory illness, diarrheal illness, or infection with *Campylobacter jejuni*. In 1976, there was a small increased risk of GBS following an influenza vaccine that was made to protect against a swine flu virus. The increased risk was approximately

one additional case of GBS per 100,000. The Institute of Medicine conducted a thorough scientific review and found no exact reason as to why this increased incidence occurred. Regardless of vaccination, the background rate is 80-160 cases of GBS each week in the United States. Background rates are important when comparing the expected rate of disease to the actual rate in any given time period. The risk of Guillaine-Barre syndrome specifically due to influenza vaccination is extremely rare and not supported by research findings (CDC, 2012). A large retrospective study from 1995 to 2006 did not find evidence of an increased risk of GBS following vaccinations including influenza vaccinations (Baxter et al., 2013). Overall, it is important to remember that severe illness and death are associated with influenza and vaccination is the best prevention. The risk of GBS following any vaccine is extremely low.

According to survey results, additional concerns were expressed regarding possible influenza vaccine ingredients such as heavy metals or gluten. This researcher could find no source that listed gluten as an ingredient. Influenza vaccine may contain the preservative thimerosal to prevent contamination of multi-dose vials. Single dose units and the live-attenuated versions of influenza vaccine do not contain this preservative. Thimerosal is a mercury-based preservative that has been used for 70 years and deemed safe by the CDC, Food and Drug Administration (FDA), and the National Institutes of Health (NIH). Scientific research endorsed by the American Academy of Pediatrics, The National Academy National Sciences' Institute of Medicine, and the Advisory Committee on Immunization Practices, found thimerosal to be a safe product to use in vaccines. Thimerosal may be associated with localized redness or swelling at the vaccine injection site. Although no evidence suggests that there are safety concerns,

since 2001 thimerosal is no longer used as a preservative for children's vaccines (CDC, 2013e). In addition, influenza vaccine may contain adjuvants such as aluminum salts to help stimulate the body's response to the antigens, stabilizers such as sugar or gelatin, egg protein, formaldehyde to kill viruses or toxins due to the manufacturing process, and antibiotics such as neomycin or sulfa drugs to prevent contamination by bacteria during the manufacturing process (CDC, 2014b). These ingredients are in extremely minute quantities per vaccine dose. As with other standard vaccinations, the protection that results may be a life saving health benefit. Further questions or concerns could be addressed individually by calling the 1-800-CDC-INFO line.

Recommendations

The RI DOH mandatory influenza vaccination policy allows for personal exemptions. Rhode Island Hospital attained an 86% and 87% employee vaccination rate since the policy has been implemented. This remains below the Healthy People 2020 goal for a 90% influenza vaccination rate for health care workers. Standard annual influenza vaccination promotional campaigns are imperative to spotlight awareness of the risks of influenza for patients and employees. Specific educational campaigns that address concerns such as vaccine ingredients and efficacy should be provided prior to and during the influenza vaccination period as well. Patient and health care worker protection from influenza should be emphasized and full support of the institution's leadership must be transparent. Unit based incentives and employee raffles may also be provided to increase vaccination rates and could be used to highlight support of the vaccination by hospital management and administration. Influenza vaccine must be available free of charge and offered at convenient times and multiple locations for all employees. Employees should be offered multiple types of the influenza vaccine including thimerosal-preserved injectable, thimerosal-free injectable, and live, attenuated nasal vaccine. Employees with a history of an egg or vaccine allergy should be offered skin tests and vaccinations in an allergy laboratory at no cost. Educational flyers, influenza fact and ingredient sheets, and in-services with expert panel members for question and answer sessions, could help assuage specific concerns or myths about influenza vaccination. Another possible suggestion is to have any further concerns or questions be answered directly by a staff Infection Control nurse, Infectious Disease physician, or designated influenza "champion". Another consideration is to make annual influenza vaccination a standard

requirement for initial and continued employment of any new employee, and to address this contingency with the upcoming nurse's union contract renewal in 2015.

Although education and incentives may increase influenza vaccination rates to a degree, policy change is the most effective intervention to increase rates to achieve the Healthy People 2020's goal to have 90% of health care workers vaccinated against influenza annually (Healthy People 2020 website, 2013). Rhode Island is one of several states to implement a mandatory policy statewide. Lowry (2009) noted that if all facilities in the community have the same mandatory policies then the motivation of all health care workers to get vaccinated will increase. Perhaps making the mandatory influenza policy truly mandatory, without the option of exemptions for personal reasons, may be the only way to achieve Healthy People 2020's goal and increase health care worker vaccination rates. The study by Rakita, et al., (2010), also speculated that if healthcare institution vaccination rates were required to be disclosed to the public, patients may choose their health care institution based on this information. A policy requiring the release of health care institution's employee influenza vaccination rates may result in increased compliance due to competition among health care providers.

It is hoped that the data resulting from the surveys have the potential to contribute to policy development concerning influenza vaccination for registered nurses and health care professionals. The results were disseminated to Rhode Island College School of Nursing faculty and students, RIDOH's Director of Immunizations, Lifespan's Director of Employee Health, and presented at the Association of Community Health Nurse Educator's annual institute. The results will provide insight and possibly assist in

modifying future educational campaigns and interventions to foster improved annual influenza vaccination rates among registered nurses and health care workers overall.

Limitations and Future Studies

This study had several limitations. The study was limited due to final sample size, which did not allow for statistical significance to be determined. The study was also only conducted at one acute care institution. Rhode Island Hospital had an 87% overall employee vaccination rate, which resulted in a smaller potential sample size of registered nurses who actually declined the vaccine and who were eligible to complete the voluntary survey. The study did not include data related to ethnicity and this would be a possible variable to explore in future studies. Future studies might explore nursing school vaccination requirements and if annual influenza vaccination is a mandatory requirement prior to placement in clinical settings. The prevalence of sick time usage due to flu-like illness among health care workers and specifically nurses who decline the influenza vaccination might also be investigated. Future studies may also explore the use of social marketing and its impact on vaccination rates. The CDC has multi-lingual influenza vaccination information, brochures and posters tailored for specific populations available on their website for free use. The CDC also includes an info-line for any questions regarding influenza. Specific information and marketing material as well as an up-to-date mobile application for clinicians are available. A study involving the use of these resources in a health care facility's campaign could be explored in relation to health care worker vaccination rates (CDC, 2013c).

Implications for Advanced Practice Nurses

In 2005, the Society for Healthcare Epidemiology of America (SHEA) endorsed influenza vaccinations of health care professionals and clearly viewed vaccination as a core patient and health care professional safety practice (Talbot et al., 2010). Advanced Practice Registered Nurses (APRNs) have an opportunity to play an important role in supporting public health by advocating for annual influenza vaccinations, providing education, and supporting policy changes. APRNs can serve as role models and foster the importance of influenza vaccination among health care workers and patients for improved overall population health and public safety. Advanced practice nurses are leaders and have the opportunity to positively influence health care choices and play a pivotal role in promoting issues involving population health. Leaders have the ability to provide direction and motivation to influence the behavior of others. Public health nurses are on the forefront of practice, education, and research initiatives to improve overall health of one and all (Ivanov & Blue, 2008). APRNs should be actively involved on councils, serve as advocates for potential legislation, and support evidence based influenza vaccination policy changes as they develop. Institutions that have successfully implemented mandatory vaccination programs associate the program's success to strong leadership, communication, and a consistent focus on the goal of patient safety. Strong, visible, and emphatic leadership support along with clear communication of the evidence-based rationale for vaccination are key to improving influenza vaccination rates (Talbot et al., 2010). Public health APRNs and all APRNs must visibly support influenza

vaccinations in order to positively impact patient outcomes, institutions, communities, and overall population health.

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Appendix A

INFLUENZA VACCINATION SURVEY

1. Have you ever had the influenza vaccination before? Yes No

2. Age Group

18-24 years 25-49 years 50-64 years 65+years

3. Male Female

4. I voluntarily decline the influenza vaccine. My reasons for declining is...

I have a medical exemption

I do not think I am at risk for getting the flu

I do not think my patients are at risk of getting the flu from me

I do not want to put anything unnatural in my body

I do not think the vaccine works

I think the vaccine makes me sick

Other reasons (please specify):

5. Highest level of education

Diploma Associate's Degree Bachelor's Degree Master's Degree

Doctoral Degree

6. Involved in Direct patient contact

Yes No

7. Number of years as a Registered Nurse

0-10 11-20 21-30 31-40 41-50 51+

PERSPECTIVES ABOUT INFLUENZA VACCINATION

8. I would only receive a vaccine if it were mandated

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

9. I am at risk for getting influenza?

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

10. People around me are at risk for getting influenza

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

11. Influenza is a serious threat to my health

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

12. Influenza is a serious threat to the health of people around me

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

13. Influenza vaccine can protect me from getting influenza

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

14. Influenza vaccine is safe

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

15. I know everything I need to know to make a good decision about getting vaccinated for influenza

___ Strongly agree ___ Agree ___ Don't know ___ Disagree ___ Strongly Disagree

Please fold this survey and place into white envelope and seal it closed. Then place sealed envelope into the large manila envelope that states COMPLETED SURVEYS in the break room. Thank you!

Survey questions excerpted from:

Influenza vaccination coverage among health-care personnel -- United States 2010-2011 influenza season. (2011). Retrieved July 25, 2013, from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6032a1.htm>

Lifespan Influenza Declination Statement

Appendix B

Rhode Island Hospital
593 Eddy Street
Providence, RI 02903

October 2013

Dear (insert Rhode Island Hospital Clinical Manager's name here):

I am writing for support of a research study to explore Registered Nurse perceptions of influenza vaccination. I am a graduate student at Rhode Island College and work at Rhode Island Hospital. I am requesting your unit's participation in this research study. The study is voluntary and will involve a 15-question survey that will take place November 2013 through March 1, 2014.

Registered Nurses who decline the influenza vaccination for the 2013 to 2014 influenza season will be asked to participate by completing an anonymous survey. Surveys will be made available in your unit's break room and participants will be asked to seal the completed survey in a white envelope upon completion. The white envelope will then be placed in a manila envelope that will clearly be labeled for completed surveys.

The results will be analyzed by the researcher and disseminated to Rhode Island College School of Nursing faculty and graduate students, as well as Lifespan's Director of Employee Health. The results will provide insight and possibly assist in modifying future educational campaigns and interventions to foster improved annual influenza vaccination rates among Registered Nurses and health care workers overall.

Please sign below to indicate your support in having your staff participate in this important study. You can contact me at lbrown2@lifespan.org.

Unit _____

Clinical Manager _____

Thank you for your time and consideration.

Leslie Brown, RN BSN
Rhode Island Hospital
MSN Student at Rhode Island College

Appendix C

IRB approval: 1/3/2014
IRB accepted: 1/16/2014
IRB expiration: 1/2/2015

October 2013

Dear Colleagues,

My name is Leslie Brown. I am a graduate student at Rhode Island College and work at Rhode Island Hospital. I am conducting a study about the perceptions of nurses who decline influenza vaccination and invite you to take part in my study called Nurse Perceptions of Influenza Vaccination. Your participation in this study will provide insight about the perceptions of Registered Nurses who decline the annual influenza vaccination during the 2013 to 2014 influenza season. If you have received the influenza vaccine during the 2013-2014, you are not eligible to take part in this study.

Your completing this survey will probably take 5 minutes of your time. If you choose to be a participant in this research, you will be asked to fill out a 15-question survey and submit it in a sealed white envelope. Place the sealed white envelope in the large manila envelope provided in the Break Room on your unit. This survey is the only thing we will ask of you.

Your completion of this survey may not benefit you personally. You will receive no compensation. Participation is voluntary and not required by Lifespan. You can choose not to participate in this research and it will have no effect on your employment or benefits. Also, you can change your mind about participating at any time without negative consequences. We are hoping these completed surveys will provide information to help provide better influenza vaccination education among nurses and health care workers.

The completed surveys will be kept confidential and remain anonymous. None of the information you provide will have your name or any identifying information on it that will identify you personally. Research records will be kept in a secure file, and access will be limited to the researcher. All data will be kept for a minimum of three years, after which it will be destroyed.

If you have any questions about this research study, you may contact the Principal Investigators, Elysia Gaynor RN MSN at (401) 444-5145. If you have any complaints about your taking part in this study, or would like more facts about the rules for research studies, or the rights of people who take part in research studies, you may contact either Patricia Houser, in the Lifespan Office of Research Administration at (401) 444-6346 or Christine Marco, PhD, of the Rhode Island College Institutional Review Board at (401) 456-8598 or email IRB@ric.edu. If you are feeling distressed over this survey, you may contact a clinical social worker at Rhode Island Hospital at (401) 444-5711.

By answering the questions on the survey, you are agreeing to participate in this study. If you do not wish to participate in this study, simply do not complete the survey.

Thank you,

Leslie Brown RN BSN