

**INCREASING INFLUENZA VACCINATION RATES AMONG LONG-TERM
CARE FACILITY
HEALTH CARE WORKERS**

A Scholarly Project Submitted in Partial Fulfillment of
The Requirements for the Degree of
Doctor of Nursing Practice
in
The Onanian School of Nursing
Rhode Island College
May 13, 2023
by
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Abstract

Seasonal influenza is a serious public health problem that is responsible for a significant number of illnesses, hospitalizations, and death. Influenza is of particular concern for individuals 65 years of age and older living in long-term care facilities. Historically health care workers working in long-term care facilities have had the lowest influenza vaccination rates compared to other health care facilities. Despite numerous efforts to increase health care worker vaccination rates, vaccination rates remain low. The purpose of this quality improvement project was to understand long-term care facility health care workers' knowledge, beliefs, and attitudes toward influenza vaccination with the aim of increasing vaccination rates by 5% from the previous influenza season. Methods included health care worker interviews and an educational toolkit with targeted themes identified from the interview data from two participating long-term care facilities. Results identified several key areas for education. Preliminary post-intervention data demonstrated an increase in influenza vaccination rates for both long-term care facilities from the previous influenza season. Conclusion: Based on feedback from health care workers who participated in the intervention, education is clearly important and should be a priority in facilities with low health care worker vaccination rates. Ensuring health care workers have easy access to getting vaccinated at their place of employment is a method to ensure access is convenient.

Key Words: Influenza; nosocomial infection influenza; influenza prevention; health care worker vaccination; influenza vaccine; patient safety; mandatory influenza; influenza vaccine hesitancy; and health care worker vaccination effects on patient safety.

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Background and Significance

Seasonal influenza is a serious public health problem contributing to significant morbidity and mortality locally, nationally, and globally (Centers for Disease Control and Prevention [CDC], 2022a). It is an acute viral infection that occurs every year, peaks during the winter months, occurs worldwide, and can affect any age group. The three types of influenza viruses that cause human disease are influenza A, B, and C. Among the different subtypes, influenza A (H1N1) and (H3N2) are the most common among humans. Influenza A and B viruses are responsible for most human illness and cause seasonal epidemics (CDC, 2023). Influenza type C typically causes a mild respiratory illness and generally does not cause epidemics (CDC, 2022g). Influenza affects all populations. However, children younger than two, adults aged 65 and older, pregnant women, and those with certain medical conditions, including chronic heart, lung, kidney, liver, blood, or metabolic diseases such as diabetes or a weakened immune system, are most at risk (CDC, 2022g). Individuals living in long-term care facilities (LTCFs) are also considered high-risk since many individuals are of advanced age and have multiple chronic health conditions. In addition, congregate living situations provide an environment facilitating the spread of infectious diseases. Influenza outbreaks occur annually in LTCFs, and the impact on this vulnerable population can be devastating, leading to health complications, hospitalizations, and death (CDC, 2020b).

The burden of influenza disease is significant and not only affects morbidity and mortality, but indirect burdens also exist. The CDC estimates that influenza has resulted in 9 million to 41 million illnesses, 140,000 to 710,000 hospitalizations, and 12,000 to

52,000 deaths annually between 2010 and 2020 (CDC, 2022a). During the 2020-2021 influenza season, influenza activity was unusually low globally and locally. Rhode Island (R.I.) had almost no influenza circulating. There were no deaths or outbreaks in congregate living facilities. (Center for Acute Infectious Disease Epidemiology [CAIDE], 2021). The level of influenza-like illness (ILI) remained low for the entire flu season. During the 2021-2022 influenza season in R.I., three influenza-associated deaths were reported. In addition, 32 non-COVID respiratory outbreaks were reported in congregate living facilities (CAIDE, 2022). There has been a decrease in influenza-related deaths and hospitalizations in part because of the COVID-19 pandemic. However, for the 2022-2023 influenza season, many protective measures, such as mask-wearing and social distancing, are no longer in place, contributing to increased influenza activity compared to the previous influenza season.

This decrease in influenza activity was similar across the United States (U.S.), even with high levels of testing. For example, during the 2020-2021 influenza season, U.S. laboratories reported 0.2% of respiratory specimens tested positive for an influenza virus. During the 2021-2022 influenza season, 4.5% of respiratory specimens tested were positive for an influenza virus (CDC, 2021a, 2022f). Individuals 65 years of age and older are considered to be at higher risk for poor outcomes due to influenza. The CDC estimates that “between 70 and 85 percent of seasonal flu-related deaths have occurred in people 65 years and older, and between 50 and 70 percent of seasonal flu-related hospitalizations have occurred among individuals in this population” (CDC, 2022d, para. 1).

A study by Molinari et al. (2007) indicated that an estimate of annual influenza epidemics resulted in an average of 610,660 life-years lost, 3.1 million hospitalized days, and 31.4 million outpatient visits, with an average of 10.4 billion dollars spent on indirect costs (Molinari et al., 2007). The authors also noted that the estimated loss of wages due to illness and loss of life amounted to 16.3 billion dollars annually. The total economic burden amounted to 87.1 billion dollars annually (Molinari et al., 2007). Another study by Putri et al. (2018) provided an updated estimate of the annual economic burden using the 2015 demographic profile reported in 2015. Putri et al. noted, “The estimated average annual total economic burden of influenza to the health care system and society was \$11.2 billion. Direct medical costs are estimated to be \$3.2 billion, and indirect costs are \$8.0 billion annually” (Putri et al., 2018, p. 3960). The decreased total costs seen in Putri et al. compared with Molinari et al. were attributed to methodological differences such as Putri et al. using a human capital approach, capturing only loss of paid work, as compared with Molinari who used a statistical value of life approach which measured loss of paid and non-paid activities of life as indirect costs. This study provides an updated estimate that confirms the significant cost impact influenza has on our healthcare system and society. To reduce the burden of influenza, efforts must continue to increase vaccination uptake in the U.S.

The COVID-19 pandemic has impacted vaccine uptake in R.I. It was noted that influenza vaccine uptake by health care workers (HCWs) working in nursing facilities during the 2021-2022 influenza season was 59.8% (Rhode Island Department of Health [RIDOH], n.d.). Further education is needed on the importance of influenza vaccination for HCWs, not only for their health but for the well-being of the patients for whom they

provide care. Influenza vaccination mandates exist in R.I. However, vaccination rates among this population of HCWs still fall below the RIDOH's goal of 92%. Implementing a multi-faceted approach, including providing HCWs with education on influenza and the importance of accepting the influenza vaccine for themselves and their patients, is just one strategy to increase vaccine uptake (Kimura et al., 2007; Looijmans-van den Akker et al., 2010; Rashid et al., 2016).

Vaccination mandates can be traced back to approximately 1776 when George Washington mandated immunization against smallpox for troops who had not gained active immunity through a smallpox infection (The College of Physicians of Philadelphia, 2023). State and local governments in the U.S. require vaccinations for attending public schools. The U.S. Supreme Court has maintained its ruling that the mandates are constitutional. "*Jacobson v. Massachusetts*, a case from 1905, is an example in which the court upheld the authority of state governments to enforce laws that require their citizens to be immunized" (The College of Physicians of Philadelphia, 2019, para. 1). The most recent ruling regarding a vaccine mandate is the COVID-19 vaccine. On January 13, 2022, a final ruling of the Supreme Court allowed the mandate of the COVID-19 vaccine for HCWs in "facilities participating in Medicare and Medicaid" (Centers for Medicare and Medicaid [CMS], 2022, para. 1).

Problem Statement and Study Question

Influenza infections among individuals 65 and older living in LTCFs cause this population to be at increased risk for hospitalizations and deaths. LTCF residents should receive the influenza vaccine; it is equally important for HCWs working in LTCFs to get vaccinated. Table 1 estimates the national rates of influenza-related disease outcomes

among the 65 and older population during the 2019-2020, 2020-2021, and 2021-2022 seasons. Data for 2019-2020 has been reported by the CDC as final. However, 2021-2022 is preliminary estimated data (CDC, 2022b, 2022c):

Table 1

U.S. Estimated Influenza Disease Burden 65+Years (per 100,000)

Year	Illness Rate	Medical Visit Rate	Hospitalization Rate	Mortality Rate
2019-2020	13747.10	1943.40	315.5	29.4
2020-2021	No data	No data	No data	No data
2021-2022	1021.5	572.00	92.9	6.9

The CDC reported very low influenza circulation during the 2020-2021 influenza season (CDC, 2021a). Therefore, no data was presented for the estimated influenza disease burden among populations during this season. The COVID-19 pandemic undoubtedly impacted the low level of influenza during the 2020-2021 season. Mitigation strategies such as mask-wearing, physical distancing, hand washing, reduced travel, and other strategies implemented to reduce the transmission of COVID-19 may have contributed to the decrease in influenza virus circulation.

In R.I., during the 2019-2020 influenza season, the RIDOH noted that 86.1% of HCWs working in nursing facilities were vaccinated. During the 2020-2021 season, 74% were vaccinated, and during the 2021-2022 season, 59.8% were vaccinated (RIDOH, n.d.). This was below the RIDOH's goal of 92%. During the 2021-2022 influenza season, nine nursing facilities had HCW vaccination rates that ranged from 24% to 39%, twenty-three had rates that ranged from 40% to 59%, eighteen had rates that ranged from 61% to 79%, and nine had rates that ranged from 82% to 100% (RIDOH, n.d.).

The CDC utilizes an opt-in panel survey to estimate the number of HCW influenza vaccination coverage during the influenza season. Table 2 is an estimate of reported overall HCW vaccination coverage, settings with the highest coverage, and settings with the lowest coverage. The highest vaccination rates were noted among physicians (98%), followed by nurses (92%) and pharmacists (90.6%). Conversely, the lowest rates were reported among assistants and aids (72.4%) and non-clinical healthcare professionals (76.6%) (CDC, 2020a, 2021b, 2022e).

Table 2

Reported Health Care Worker Vaccination Coverage

Characteristics	2019-2020	2020-2021	2021-2022
Overall HCWs	80.6%	75.9%	79.9%
Hospital	93.2%	91.6%	92.0%
Long-Term Care	69.3%	66.0%	66.4%

R.I. has rate similar vaccination rates for its HCWs (Table 3) (*RIDOH, n.d.*).

Table 3

RIDOH Health Care Worker Vaccination Coverage

Characteristics	2019-2020	2020-2021	2021-2022
Overall HCWs	88.0%	77.0%	79.1%
Hospital	92.9%	78.5%	87.9%
Nursing Facilities	86.1%	74%	59.8%

RIDOH data demonstrates that many LTCFs remain below the RIDOH's goal of 92% for HCW influenza vaccinations. Increased uptake by HCWs has been shown to reduce morbidity and mortality among geriatric long-term care patients (Potter, 1997). Increasing influenza vaccines among LTCF HCWs is critical during a severe influenza season. The COVID-19 pandemic makes influenza vaccination more urgent. As individuals need more medical care, sustaining the health and well-being of our health care workforce is essential to ensure adequate health care personnel. Influenza vaccination protects not only the HCW but also those for whom they provide care.

This quality improvement (QI) project aimed to increase HCW influenza vaccinations by 5% among two R.I. LTCFs by the end of the 2022-2023 influenza season. An educational program was developed for the Directors of Nursing (DONs) and Infection Prevention and Control (IPC) nurses at two R.I. LTCFs with HCW vaccination rates below the RIDOH's goal. Implementation occurred during the 2022-2023 influenza season. This program included five components: 1) interviews to assess the HCWs' vaccination intention, hesitancy, and knowledge related to the influenza vaccine; 2) educational handouts for facilities to provide education and encourage vaccination; 3) an in-service educational program with a post-education evaluation form for HCWs; 4) a leaderboard to display the facility's HCW influenza rates to be utilized as an evaluation tool to measure uptake of HCW influenza vaccinations; and 5) incentives for interview participants and HCWs who accepted the influenza vaccine during the 2022-2023 season. The participating LTCFs were to utilize the leaderboard to update their HCW influenza vaccination rates monthly to improve the transparency of the organization's vaccination rates. The COVID-19 pandemic creates a significant risk of coinfection among this

vulnerable population. Many LTCFs saw a decrease in the influenza vaccine uptake that coincided with the COVID-19 pandemic. Acceptance of the influenza vaccine in LTCFs is essential to reduce the spread of influenza among vulnerable residents and to avoid influenza and COVID-19 coinfection. HCW vaccination against influenza is critical to decreasing this risk.

Local Context

To increase influenza vaccination coverage among HCWs and to attempt to meet the Healthy People 2020 objective of 90% HCW vaccination (Office of Disease Prevention and Health Promotion, 2017), the RIDOH proposed an amendment to the *Rules and Regulations Pertaining to Immunization, Testing, and Health Screening for Health Care Workers (R23-17-HCW)* that would require HCWs to receive the annual influenza vaccine. The article *Influenza Vaccine: A Regulatory Mandate in Rhode Island* (Keough, 2014) described changes to the regulations on immunization, testing, and health screenings for HCWs in R.I. In 2012, an amendment to the state regulation was presented to reflect the CDC's Advisory Council on Immunization Practices (ACIP) recommendation mandating HCWs to receive an annual influenza vaccination (Keough, 2014). The amendment required HCWs to receive the influenza vaccine or wear a mask when providing patient care. A public hearing was held to allow for discussion from various perspectives. Supporters of the influenza vaccine mandate argued that HCWs must protect their patients from infectious diseases, especially those most vulnerable and those individuals for whom the vaccine's efficacy may be poor. Opponents of the change cited the autonomy of nurses' rights, vaccine safety issues, and lack of vaccine efficacy (Keough, 2014). On October 23, 2012, R.I. became the first state to mandate that all HCWs receive the influenza vaccine annually or wear a mask

when providing direct patient care when influenza is deemed “widespread” by the RIDOH Director of Health (Keough, 2014). HCWs who do not receive the influenza vaccine must provide proof of medical exemption or a signed declination to their health care facility annually by December 15th (Kim et al., 2014). Any HCW who held a license issued by the RIDOH and violated section §7.8(C), §7.8(D), or §7.8(E) would be subject to a one-hundred-dollar fine for each such act (State of Rhode Island and Providence Plantations Department of Health, 2012).

Health care facilities are required to report HCW vaccination data to the RIDOH at the end of the influenza season each year between April 1st and May 15th. Influenza vaccination coverage among HCWs was evaluated during the 2013-2014 influenza season in R.I. as described in an article by Kim et al. (2015). In 2013-2014, 88.7% of health care facilities reported their HCW vaccination data compared to the 2012-2013 and 2011-2012 influenza seasons, where 59.0% and 26.9%, respectively, had reported (Kim et al., 2014).

The data collected demonstrated not only an increase in reporting but also showed an increase in HCW vaccination. Vaccination of HCWs increased from 69.7% during the 2011-2012 influenza season to 87.2% during the 2012-2013 season and 88.1% during the 2013-2014 season (Kim et al., 2014). Increasing influenza vaccination rates for HCWs has brought the state closer to the Healthy People 2020 goal of 90%. However, in March 2022, the *Rules and Regulations Pertaining to Immunization, Testing, and Health Screening for Health Care Workers* was amended to include requirements for COVID-19 vaccination. Annual influenza vaccination continues to be a requirement for all HCWs. Influenza vaccine declination continues as long as proper annual written notices are provided before December 15th of each year to each health care facility where the HCW

provides care. Another amendment is the removal of the one-hundred-dollar fine (State of Rhode Island and Providence Plantations Department of Health, 2022). Many HCWs are required to wear a mask in the health care setting, which could impact HCWs' acceptance of the influenza vaccine if the consequence is something they must already do.

Purpose Statement and Specific Aims

This QI project aimed to increase HCW vaccination rates by 5% at two R.I. LTCFs. Outcome measures are an essential element of a QI project. Specific aims included the following:

1. LTCF Directors of Nursing (DONs) and Infection Prevention and Control (IPC) nurses or designees will have an informational brochure for recruiting interview participants by September 2022.
2. LTCF DONs will have increased knowledge of why LTCF HCWs decline the influenza vaccine by May 2023.
3. LTCF HCWs will have increased knowledge of basic influenza infection prevention by November 30, 2022.
4. LTCF HCWs will have increased knowledge of the importance of influenza vaccination by November 30, 2022.
5. LTCF HCWs will have the option to schedule influenza vaccinations at their place of employment by September 30, 2022.
6. LTCFs will increase HCW influenza vaccination uptake by 5% by March 1, 2023.
7. LTCFs will have access to the educational toolkit as required annual training for all existing HCWs and new hires by November 30, 2022.

Conceptual/Theoretical Framework

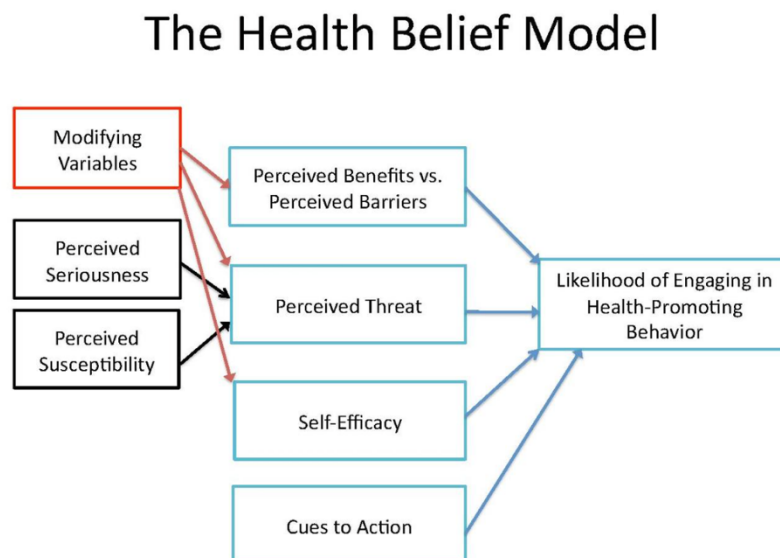
The two theoretical frameworks guiding this QI project were the Health Impact Pyramid (HIP) and the Health Belief Model (HBM). The HIP (Figure 1) is a framework designed by Dr. Thomas Frieden, the acting director of the CDC from 2009-2016. In 2010, he established a five-tiered pyramid to describe the different types of public health interventions and their relative impact on improving health outcomes. The five tiers address counseling and education, clinical interventions, long-lasting protective interventions, changing the context to make individuals' default decisions healthy, and social-economic factors. The most significant health impact is achieved at the lower base of the pyramid requiring the least amount of individual effort and having the greatest public health impact (Friedan, 2010). For this project, interventions will address social-economic factors, changing the context to make individuals' default decisions healthy, and counseling and education. Although counseling and education may have a small impact, addressing the other tiers in combination with counseling and education could considerably impact HCW influenza vaccine uptake. The amendment of RIDOH's *Rules and Regulations Pertaining to Immunization, Testing, and Health Screening for Health Care Workers* may have an impact on HCWs' acceptance of the vaccine due to current COVID-19 vaccine requirements.

Figure 1*Health Impact Pyramid (Friedan, 2010)*

The HBM (Figure 2) was developed in 1950 by Godfrey Hochbaum, Irwin Rosenstock, and Stephen Kegels. It is a theoretical model used to guide health promotion and disease prevention. The model is used in understanding health behaviors and includes six concepts in predicting health behavior. They include susceptibility, risk severity, benefits to action, barriers to action, self-efficacy, and cues to action to explain and predict individual changes in health behaviors (Butts & Rich, 2018).

Figure 2

Health Belief Model (Pennsylvania State University, n.d)



The use of both models was essential in guiding this QI project. The HIP was used to assess the social-economic factors, changing the context to make an individual's decisions healthy by understanding HCWs' perception of the mandate and the accessibility of the influenza vaccine and incorporating counseling and education. The HBM was used to understand the reasons behind low influenza vaccination rates among HCWs and guide interventions to promote health behavior change.

Methods

Setting

Data on influenza vaccination rates among LTCF HCWs reported to the RIDOH for the 2019-2020, 2020-2021, and 2021-2022 influenza seasons were analyzed. An assessment of LTCFs with influenza vaccination uptake lower than the RIDOH's goal was reviewed to identify possible participants for this QI project. A number of LTCFs were

suggested for participation by the R.I. Long Term Care Ombudsmen. Two LTCFs with HCW vaccination rates below the goal were contacted to explore their interest in participation. In addition, an attempt was made to contact other facilities with vaccination rates below the state's goal, but the facilities did not respond to requests.

Participants

Participants in this QI project included two LTCFs with HCW influenza vaccination rates below the RIDOH goal of 92%. Specifically, the DONs, IPC nurses, and HCWs as defined by the RIDOH, were directly involved in the project.

An assessment was performed in August 2022 with each of the participating LTCFs. At the time of the assessment, LTCF-A employed a total of 118 HCWs that consisted of registered nurses (RNs), licensed practical nurses (LPNs), certified nursing assistants (CNAs), and staff identified as other. LTCF-B employed a total of 104 HCWs. The HCW breakdown consisted of CNAs, RNs, LPNs, med techs, and staff identified as other. Both facilities reported not having an organizational mandatory HCW influenza vaccination policy and offering influenza vaccination clinics at their facility during all HCW shifts. Both facilities contracted with a local pharmacy to provide on-site vaccinations and stated that they would provide vaccinations to staff if they could not attend one of the offered vaccine clinics. Table 4 represents each facility's previous HCW vaccination rates at the time of assessment for the following influenza seasons:

Table 4

Flu vaccination rates of healthcare workers. (RIDOH, n.d)

LTCF-A	LTCF-B
2019-2020 = 74%	2019-2020 = 83%
2020-2021 = 38%	2020-2021 = 79%
2021-2022 = 46%	2021-2022 = 61%

Each facility described past strategies to increase influenza vaccine uptake during the assessment. LTCF-A reported offering staff education sessions and handouts, including handouts in different languages. LTCF-B reported implementing mandatory education. The mode of delivery has been group discussions. They described using group discussions as an opportunity to understand their HCWs' baseline knowledge which occurred at the end of September or early October. They reported using signage and following CDC recommendations. LTCF-B further described using email reminders for vaccine clinics and vaccine "champions" to encourage HCW vaccination. Other motivational tools used included incentives such as prizes and rewards. LTCF-B noted that HCWs lose interest if the educational sessions last longer than 15-20 minutes.

Both facilities noted that in the past, one motivating factor for HCWs to get their influenza vaccine was that they would not be required to wear a mask if they were vaccinated. However, with COVID-19, mask-wearing was now required in these facilities. Both facilities reported mid-October as the time when they begin their vaccination clinics.

Intervention

Each facility was offered a flyer in English and Spanish to be displayed to recruit HCWs who wished to participate in the interview process. One facility utilized a sign-up sheet, and the other performed active staff outreach. In September and October 2022, twenty HCWs from LTCFs A and B were interviewed using a tool with open-ended questions framed using concepts from the HBM (Appendix A). HCWs who agreed to participate completed a consent form. Consent forms were offered in English, Spanish, and Cape Verdean. Interview participants were given a five-dollar Stop and Shop gift card for participating. Demographic information, including age, race, ethnicity, gender, and HCW role, was collected. Eighteen questions were asked that consisted of the following topics: vaccination status, knowledge, historical influence, religion/culture, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. A graduate research assistant provided interpreting services in Spanish for participants as needed. The HCW interviews were recorded and transcribed. The information collected from the interviews was used to identify common themes. The educational toolkit was developed based on the identified themes.

Each LTCF was offered two days of staff education during October and November. A draft toolkit was provided to each facility outlining the content and resources that would be utilized for the educational intervention. The mode of delivery was via in-person in-service and just-in-time education. During the in-service, a PowerPoint presentation was delivered every twenty minutes. In addition, handouts were included that addressed myths and facts about the influenza vaccine, recognizing symptom similarities and differences between COVID-19 and influenza, hand hygiene, and the importance of HCW vaccination.

Handouts were provided in English and Spanish. LTCF-A had 23 HCWs attend. However, of the 23, seven were not LTCF staff. Six were nursing students and one faculty member who were at the facility for their clinical rotation. Education was delivered as an in-service for HCWs. However, just-in-time education was the primary mode of delivery due to challenges with allowing time for staff education. HCW interviews and the ability to allow time for education were identified as challenges due to a lack of staffing. LTCF-B had 48 HCWs attend the in-service. Leadership at LTCF-B required HCWs to attend compared to LTCF-A, which did not. Upon completion of the on-site education, the final toolkit was provided to both facilities for any HCW who could not attend the in-person sessions. The final toolkit included instructions and content, a recorded narration of the PowerPoint presentation, handouts, a sign-in sheet, a vaccine sign-up sheet, a vaccination leaderboard, vaccine champion pins, and vaccination stickers. In addition, three twenty-five-dollar Visa gift cards were provided to each facility as part of the toolkit to be used as a raffle for HCWs who received their influenza vaccine during the 2022-2023 season.

Measures

The DONs or IPC nurses collected HCW influenza vaccination data for the 2022-2023 influenza season using their current data collection process for reporting HCW vaccination rates to the RIDOH.

Analysis

An analysis of the HCW interviews was performed. Participants included twenty HCWs. The demographic breakdown is presented below in Table 5.

Table 5*HCW Interview Demographics*

Demographics N=20							
Age	Result	Gender	Result	Race	Result	Ethnicity	Result
Average	56.35	Male	15.0%	Black	10.0%	African American	5.0%
Range	18-83	Female	85.0%	Native American	5.0%	Cape Verdean	5.0%
				Unknown	5.0%	Hispanic	5.0%
				White	80.0%	Other European/American	85.0%
						Unknown	5.0%

Based on an analysis of the HCW interview data, common themes were identified, including vaccine development; vaccine safety and side effects; vaccine myths and facts; influencing factors, vaccine reactions, HCW risk, HCW risk of getting influenza, and COVID coinfection; HCW belief that influenza is a serious infectious disease, influenza is a serious infectious disease for people 65 years of age and older, vaccination results in influenza prevention, vaccination protects family and residents, vaccination makes them sick, and HCW influenza vaccination resulting in protection of high-risk groups. This data was utilized to develop the educational intervention.

Ethical Considerations

A letter of agreement was obtained from the two identified LTCFs demonstrating approval of the project. In addition, the Institutional Review Board (IRB) at Rhode Island College declared that the project was exempt since it was a QI project and did not involve research on human subjects. The approval from the IRB is available as Appendix B.

An informational flyer describing the project was developed and offered to the LTCFs to inform their HCWs of the project and the request for interview participants. The flyer was provided in English and Spanish and is available as Appendix C. LTCF

HCWs' participation in the interview process included consent and was voluntary. The interviews were recorded and transcribed. Interview data did not contain identifying information. To ensure security and confidentiality, interview information collected was saved and stored in a locked cabinet at Rhode Island College for a minimum of three years. Only the principal investigator and the DNP student had access to the data. Therefore, no risk of harm existed for the participants. In addition, an attendance sheet was utilized to track participant completion of the educational session, which was provided to the facilities after the educational in-service.

Results

Tools used to evaluate the facilities' influenza vaccination rates were based on the facilities' data, which is planned to be reported to the RIDOH by May 15th. This QI project aimed to increase LTCF HCW vaccination rates by 5% by implementing an educational intervention. As of March 14, 2023, LTCF-A reported that 69 of 125 (55%) HCWs were vaccinated. As of March 20, 2023, LTCF-B reported that 71 of 104 (68%) HCWs were vaccinated. Based on this data analysis (Table 6), LTCF-A had an increase in HCW influenza vaccination of 9%, and LTCF-B had an increase of 7% compared to the previous influenza season. LTCF-B had the highest number of participants who attended the educational intervention, with 46% staff attendance, compared with LTCF-A, which only had 13% of staff attend.

Table 6*Preliminary HCW Vaccination Data*

LTCF	# of HCWs	2021-2022	# of HCWs	2022-2023	Change
		Rates		Rates	
LTCF-A	97	46%	125	55%	+9%
LTCF-B	104	61%	104	68%	+7%

A one-tailed chi-square analysis was performed to determine if there was a statistically significant change between the HCW influenza vaccination uptake from the 2021-2022 influenza season to the 2022-2023 season. The preliminary data presented in Table 7 indicates no statistical significance. However, further analysis is recommended once the LTCFs have reported their final HCW vaccination data to the RIDOH.

Table 7*Analysis of Baseline (2021) to Preliminary Post-Intervention (2022) Vaccination Rates*

	2021 <i>n</i> (%)	2022 <i>n</i> (%)	<i>p</i> =
<i>All Participants</i>	108 (53.73)	140 (61.14)	0.06
<i>LTCF-A</i>	45 (46.40)	69 (55.20)	0.10
<i>LTCF-B</i>	63 (60.58)	71 (68.27)	0.12

Analyzed via One-Tailed Chi-Square

HCW feedback post-education was obtained and identified the following themes and actions that the HCWs' would change regarding their professional practice/performance:

Vaccinations	Infection Control
<ul style="list-style-type: none">• Get vaccinated• Stay up to date on vaccines• Have an open mind• Encourage and educate others to get vaccinated	<ul style="list-style-type: none">• Avoid touching face/eyes/mask• Wash/disinfect surfaces more• Wash hands

HCWs were also asked about other health care/professional topics they would like to see presented; they shared the following as topics that they would like to learn more about:

- Updates on COVID-19 symptoms, COVID-19 vaccines, and effects from vaccines
- Tdap vaccine
- RSV
- Dementia
- Communication skills

These additional educational requests will be shared with the LTCFs' administration as an executive summary.

Limitations of this project included the potential for selection bias. On an individual level, those HCWs who may have been more accepting of vaccination may have been more likely to participate in the interviews since interviews were voluntary. Secondly, interventions occurred at two LTCFs where the influenza vaccination rates were below the RIDOH's goal of 92% (46% and 61%) during the 2021-2022 influenza season. However, these two facilities were above the lowest vaccination rates of some LTCFs leading to the

potential for organizational selection bias. Due to the scope of the project, two LTCFs participated in the project. Therefore, the results may not be generalizable to all LTCFs in the Northeast. Other regions may not have the same factors, cultures, and/or policies, which may have impacted these results. LTCF-A and B reported working with a pharmacy to administer the influenza vaccine to their HCWs. LTCF-B reported working with a pharmacy to administer HCW influenza vaccines for the 2022-2023 influenza season. However, this was not the case for the previous season. LTCF-B shared that this may have impacted uptake, especially if the vaccination clinics were not conducted during a time when the HCWs may be working. Both facilities reported obtaining vaccines to administer to HCWs who wanted to get vaccinated and may have missed the previous opportunity. During this QI project, COVID-19 presented challenges, such as HCW shortages, HCWs' lack of willingness to receive additional vaccinations, and challenges with the ability of LTCF administrators to continue educating their HCWs with the tools provided for those who were unable to attend the educational intervention. LTCF-B utilized the resources in the toolkit to continue ongoing education for staff who had not received the influenza vaccine. Neither LTCF used the HCW vaccination leaderboard nor had an identified vaccine champion. Other limitations included the need to collect the facilities' vaccination rates before the RIDOH's reporting deadline, which may not have captured the full impact of this QI project.

Discussion

Vaccination continues to be the best public health measure for protection against infectious diseases like influenza. HCWs working in LTCFs continue to have the lowest vaccination rates compared to other HCWs working in other facilities. HCWs who work

in LTCFs should receive their annual influenza vaccine to protect themselves and those they care for from contracting this serious infectious disease. Individuals 65 years of age and older living in LTCFs are at greater risk for serious health outcomes if infected with influenza. Therefore, annual HCW education must be mandated to provide continuing education on this important topic with an outcome of increasing vaccination rates.

Key findings and observations of this QI project include that LTCFs are often understaffed, making it challenging to allow time for staff education. LTCF HCWs required to participate in staff education were more likely to participate despite barriers such as understaffing. The COVID-19 pandemic and continued requirements of mask-wearing may have impacted HCWs' perception of the need for the influenza vaccine, which was identified as one theme during the interviews. LTCFs are challenged with obtaining HCW vaccination records if the HCW received their influenza vaccine elsewhere, which may impact the facility's HCW influenza vaccination rates.

Implications for Practice

Implications for practice are evident. The DNP-prepared nurse can be instrumental in implementing change in all practice settings, including long-term care. It is the role of the advanced practice nurse to collaborate with community practice partners to ensure the health and safety of our populations, especially those who are most vulnerable, including the young, elderly, and those who are immunocompromised. Advanced practice nurses should educate HCWs, administrators, and the public on the evidence-based need for vaccinating workers, residents, and the larger population to provide herd immunity and reduce risk. Through education, advanced practice nurses can be agents of change for the nursing culture to understand the safety element vaccination contributes toward protecting

patients. Implementing QI projects is a valuable means to evaluating the effectiveness of HCW vaccination in preventing negative influenza outcomes in LTCF residents. LTCFs should mandate annual influenza education that includes campaigns that reinforces the need for all HCWs to be vaccinated. They must understand the risk influenza has on individuals who need health care within a facility. An influenza infection puts these individuals at greater risk, especially those in LTCFs. LTCF leaders should ensure educational opportunities are available for their HCWs.

Evaluation of the efficacy of this type of project is essential in supporting the adoption of an annual HCW educational in-service. Advanced practice nurses must advocate for public health and safety policies by partnering with organizational leadership and local public health agencies. Research should be ongoing to understand why HCWs in LTCFs decline the influenza vaccine. LTCFs should continue to evaluate why their HCWs decline the vaccine. They should provide education and evaluate those who previously declined the influenza vaccine and received it after the educational intervention to understand the reason for the change. LTCFs should require all HCWs to receive annual influenza education.

DNP-prepared nurses should advocate for state-level policy changes aimed at improving the health of vulnerable populations. One recommendation includes advocating for state-level mandates for HCWs who work in LTCFs to receive their annual influenza vaccine or require facilities to mandate the influenza vaccine for all of its HCWs, visitors, and patients. HCW autonomy, while important, directly impacts those for whom they provide care. HCWs are required to receive other vaccinations prior to working in a health

care setting, and the influenza vaccine should be no exception. HCWs have a role in protecting vulnerable residents, including protecting them from themselves.

Conclusion

Vaccination is the best method of protection, particularly for those who are most vulnerable. HCWs have an ethical responsibility to do no harm, including protecting patients from infectious diseases. Vaccination remains one of the most effective methods of primary prevention towards protecting the population from serious illness and death. The COVID-19 pandemic is ongoing, and DNP leaders must ensure that our most vulnerable patient populations do not become coinfecting with influenza and COVID-19. Strategies for improvement for this QI initiative would include the involvement of front-line staff when identifying reasons why HCWs declined the influenza vaccine. Why many HCWs in LTCFs decline the influenza vaccine has yet to be fully understood. Creative approaches, including a needs assessment of HCWs and tailoring educational content to identified themes, learning needs, and cultural beliefs, are beneficial to this educational toolkit's success and sustainability.

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Appendices

Appendix A

*Interview Tool									
Demographics	Vaccination Status	Knowledge	Historical Influences	Religion/Culture	Perceived Susceptibility	Perceived Severity	Perceived Benefits	Perceived Barriers	Cues to Action
Age, Race, Ethnicity, Gender, HCW Role	Did you receive your flu vaccine last year? Why or why not?	What would you like to know about the flu vaccine and influenza disease?	Can you talk about things from the past in your own history, your family's history, or just general history that would influence you to not get the flu vaccine?	Can you share with me if you have any religious or cultural reasons that influence your decision to getting the flu vaccine?	As a health care worker, do you believe you are at risk for getting infected with the flu? Why or why not?	Do you believe the flu is a serious infectious disease? Can you tell me why you believe it is or isn't?	Do you believe the flu vaccine is helpful in preventing influenza disease?	Do you believe that the flu vaccine makes you sick?	Can you tell me your thoughts are on health care workers getting the flu vaccine?
	Do you plan to get your flu vaccine this year? Why or why not?	Do you feel the flu vaccine is safe? Why or why not?	Have you experienced a bad reaction to the flu vaccine? If so, what happened?		Do you believe you could become infected with the flu and COVID-19? Why or why not?	Do you believe that the flu is a serious infectious disease for people who are 65 years of age and older? Why or why not?	Do you believe by getting the flu vaccine it can protect your family and those you care for from getting the flu? Why or why not?	Do you believe that the flu vaccine gives you the flu?	As a health care worker do you feel getting the flu vaccine will help protect those who are at higher risk?
								Do you have an allergy to a component of the flu vaccine?	
<p>*Interview Questions were adapted from the following references:</p> <p>The World Health Organization. (2022, March 22). Report of the Sage Working Group on Vaccine Hesitancy. https://cdn.who.int/media/docs/default-source/immunization/sage/2014/october/2-sage-appendicies-background-final.pdf?sfvrsn=2259f1bf_4</p> <p>European Centre for Disease Prevention and Control. (2017). Catalogue of interventions addressing vaccine hesitancy. Retrieved from https://www.giant-int.org/wp-content/uploads/2020/12/4_survey_questionsRevised.pdf</p>									

Protocol Detail Report

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Report Comments
Protocol Information

Version # 1

Reference Number: 2326	
Protocol Number: 2122-2326	
Protocol Title: Increasing Influenza Vaccination Rates Among Long Term Care Facility Healthcare Workers	
Protocol Type: Original	
Principal Investigator: Costello, Joanne	Approval Date: 7/26/2022
Submittal Date: 7/25/2022	Effective Date: 7/26/2022
Author: Chicoine, Wendy	Renewal Date: 7/26/2027
Status: Approved	Next Review Date: 7/26/2027
Inactive Date:	Expiration Date: 7/26/2027

Instructions for Quality Improvement Submission

1

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Appendix C



Health care workers and the influenza vaccine



- ◇ **What are some of the reasons you get your flu vaccine every year?**
- ◇ **What are some of the reasons you do not get the flu vaccine?**

Please join Rhode Island College DNP student Wendy Chicoine on X, X 2022, from X-X for a focused interview session to better understand the why or why not behind health care worker influenza vaccine acceptance.

A \$5 gift card will be provided to health care workers who participate in the interview.



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Los trabajadores de la salud y la vacuna contra la influenza



- ¿Cuáles son algunas de las razones por las que se vacuna contra la gripe cada año?
- ¿Cuáles son algunas de las razones por las que no recibe la vacuna contra la gripe?

Por favor únase con la estudiante del Colegio Universitario de Rhode Island Wendy Chicoine, Doctorada en Practica de Enfermería el X, X 2022, de X-X para una sesión de entrevista enfocada para comprender mejor el por qué o por qué no detrás de la aceptación de la vacuna contra la influenza por parte de los trabajadores de la salud.

Se va a regalar una tarjeta de regalo de \$5 a los trabajadores de la salud que participen en la entrevista.



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