Examining Opportunities to Increase Flu Vaccine Uptake on College Campuses Through Pharmacy Partnerships

Kristi Hargrave
kmh16d@acu.edu

Follow this and additional works at: https://digitalcommons.acu.edu/etd

Part of the Public Health and Community Nursing Commons

Recommended Citation
Hargrave, Kristi, "Examining Opportunities to Increase Flu Vaccine Uptake on College Campuses Through Pharmacy Partnerships" (2019). Digital Commons @ ACU, Electronic Theses and Dissertations. Paper 167.

This is brought to you for free and open access by the Electronic Theses and Dissertations at Digital Commons @ ACU. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Digital Commons @ ACU.
This doctoral project, directed and approved by the candidate’s committee, has been accepted by the College of Graduate and Professional Studies of Abilene Christian University in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

Date: ___9/27/2019__________

Doctoral Project Committee:

Jonas Nguh
Dr. Jonas Nguh Chair

Tonya Sawyer-McGee
Dr. Tonya Sawyer-McGee

Molly Kuhle
Dr. Molly Kuhle
Abilene Christian University
School of Nursing

Examining Opportunities to Increase Flu Vaccine Uptake on College Campuses Through Pharmacy Partnerships

A doctoral project submitted in partial satisfaction of the requirements for the degree of Doctor of Nursing Practice

by
Kristi Hargrave
October 2019
Dedication

I would like to dedicate this project to my husband Brad and my children Collin and Brooke. Thank you for encouraging me to persevere. Thank you for understanding when I had to spend hours in schoolwork instead of in family time. Lastly, thank you for inspiring me to be my best.
Acknowledgments

First, I would like to thank God for giving me the strength and helping me through the process of obtaining my DNP degree. I would also like to thank my husband, my children, and my parents for their support and encouragement through this time. When I was young, my dad always told me that I could do anything I set my mind to, even be president of the United States. While I have no intentions of running for office anytime soon, the parenting I received allowed me to dream big. My mom has the best work ethic of almost anyone I know. I see this degree as an extension of beliefs they instilled in me early in life. I could not have done any of this without the support of all of my family and the blessings of my heavenly father.

My committee members, Dr. Jonas Nguh, Dr. Tonya Sawyer-McGee, and Dr. Molly Kuhle, helped guide me through this process and gave me valuable feedback to keep me on the path. I appreciate the Abilene Christian University library and writing team for helping with education and editing. A special thank you to Amanda Williams, MSN, RN, NP-C. Without your support, I could not have done this project. Thank you to pharmacist Carolyn Crust, who was an integral component to this partnership and so wonderful to work with. A special thank you goes to Dr. Kris Mauk, who was always willing to talk things through with me if I needed help along the way. Dr. Barbara White and my colleagues prayed me through every step of the way. I valued all the support that everyone gave me that helped me be successful in this project and achieve the dream of having my doctorate.
Abstract

The purpose of this project was to examine a university health clinic’s influenza vaccination program in a suburban city in a western U.S. state, and to explore the effects of partnering with a local pharmacy to overcome billing issues. A program evaluation was conducted to identify the potential barrier of cost for students. The health clinic was not set up to bill private health insurance for students; therefore, if students wanted to get a flu shot, they had to pay out of pocket for it. A pilot program was created in conjunction with the program director, partnering with the local branch of a national pharmacy chain to bring in its services for the day. The pharmacy could bill students’ private insurance, making the immunization free for students who had coverage. The impact on overall influenza vaccination rates was evaluated by comparing data from the program extension and historical data from years with no pharmacy partnership. The results showed a significant increase in vaccination rates with the pharmacy mobile clinic option. Key recommendations for universities that do not bill student insurance for influenza vaccines given in the health clinic include: (a) partner with a local pharmacy to provide mobile flu shot clinics on campuses for two or more days; (b) discuss with the pharmacy if it can write off denied claims for students, and if so, get an agreement in writing; and (c) market the mobile flu shot clinic using the principles of the theory of planned behavior.

Keywords: college, students, university, influenza vaccination, flu, partnerships, programs
Table of Contents

Dedication ........................................................................................................................... i

Acknowledgments ............................................................................................................... ii

Abstract ............................................................................................................................... iv

List of Tables ....................................................................................................................... vii

List of Figures ...................................................................................................................... viii

Chapter 1: Introduction ....................................................................................................... 1

Statement of the Problem ................................................................................................... 1
Background ......................................................................................................................... 2
Purpose of the Study .......................................................................................................... 4
Significance ........................................................................................................................ 4
Nature of the Project .......................................................................................................... 5
Question Guiding the Inquiry: PICOT Question and Hypothesis .................................. 6
Research Question .......................................................................................................... 6
Theoretical/Conceptual Framework ................................................................................ 7
Definition of Key Terms .................................................................................................. 9
Scope of Project ................................................................................................................. 11
Summary ............................................................................................................................. 11

Chapter 2: Literature Review ............................................................................................. 13

Introduction to the Problem and the Research ................................................................. 13
Attitudes of Students Toward Influenza and Vaccination .................................................. 14
Interventions That Effectively Increase Flu Vaccination Among Students ..................... 17
Framing Messages to Students to Increase Motivation ...................................................... 18
Offering Flu Shot Clinics in a Variety of Locations, Including Mobile Clinics ................. 19
Vaccine Efficacy and Historical Data ............................................................................. 23
Theoretical Framework Discussion ................................................................................. 25
Conceptual Framework Discussion ................................................................................. 26
Summary ............................................................................................................................. 27

Chapter 3: Methodology .................................................................................................... 28

Planning for Measures to Improve Primary Prevention .................................................... 28
Project Design ................................................................................................................... 29
Instrument/Measurement Tool ....................................................................................... 29
Data Collection, Management, and Analysis Plan ............................................................ 30
Methodology Appropriateness .......................................................................................... 33
List of Tables

Table 1. DNP Project Timeline ................................................................. 38
Table 2. Demographic Data: Undergraduate Enrollment, 2012–2018 .............. 41
Table 3. Demographic Data: Student Demographics .................................. 42
Table 4. On-Campus Flu Shot Uptake ....................................................... 45
Table 5. Results of the Two-Proportion $z$ Test ......................................... 48
List of Figures

Figure 1. An illustration of the PNPDF conceptual framework. ........................................... 9

Figure 2. An illustration of the Sigma Six DMAIC road map.............................................. 42

Figure 3. A bar graph of the percentage of students vaccinated on campus by year ....... 46
Chapter 1: Introduction

Despite the recommendations of the Centers for Disease Control and Prevention (CDC) for everyone more than six months of age to receive an annual flu vaccine, fewer than 20% of U.S. college students typically receive the vaccine (Monn, 2016). Low levels of flu vaccination among undergraduate students on campuses across the United States are a public health concern (Svokos, 2014). This is important because campus life brings people into close proximity in dormitories, classrooms, libraries, and cafeterias. In addition, students often gather in large numbers at sporting events, organized university activities such as chapel, and unorganized events such as parties (CDC, 2012). These community events and activities create opportunities for respiratory illnesses such as the flu to spread quickly, impacting students on college campuses (CDC, 2012). While preventing the spread of influenza can entail coordination between the government, nongovernmental organizations, and other political entities, coordination often occurs at the local level through community-based clinics including primary care providers, local health departments, or student health centers (Lawrence, 2014).

Statement of the Problem

The problem I addressed in this project was low influenza vaccination rates among college students at a private faith-based university in a western U.S. state. Research has shown that “college students are notoriously difficult to vaccinate against the flu” (Lawrence, 2014, p. 425), and students have “unwarranted optimism about their own health” (Svokos, 2014, para. 12), often not seeing the flu as a personal risk. Low vaccination rates are ubiquitous at college campuses across the nation (Svokos, 2014). I identified the issue of low vaccination rates at the site for this project through personal communication with the clinic director and by examining the number of vaccinations given on campus over the past several years. This validated that the
university where the Doctor of Nursing Practice (DNP) project occurred was like other campuses in that there was low uptake of influenza vaccine among undergraduate college students.

College students may not realize the potential severity and impact of the influenza virus on people and society. During the flu season of 2017–2018, there were an estimated 49 million cases of the flu, with approximately 960,000 hospitalizations and 79,000 deaths (CDC, 2012). Additionally, O’Brien (2017) pointed out that getting the flu can impact students’ pocketbooks, stating it can “wreak havoc on . . . [their] finances” (para. 1). O’Brien (2017) estimated the annual direct cost for hospitalizations and outpatient visits related to getting the flu was over $10 billion. In fact, one certified financial analyst stated that “the low or free cost of the shot is one of the greatest deals of everyday living, given what it can cost if you get the flu. Getting the shot should be a no-brainer” (O’Brien, 2017, para. 6). While getting the flu can impact anyone, college students have unique circumstances that make getting the flu more than inconvenient. Symptoms of an influenza-like illness (ILI) often cause students to miss class, do poorly on a test or an assignment, miss work, take time to visit a health care provider, and pay for over-the-counter and prescription medications (Nichol, D’Heilly, & Ehlinger, 2005). Getting the flu is more than inconvenient; it is dangerous and costly to students and to the community as a whole.

**Background**

The main strategy for disease prevention against the flu for the last 60 years has been the flu vaccine (Osterholm, Kelley, Sommer, & Belongia, 2012). However, influenza vaccine effectiveness has varied throughout the years. Influenza, unlike many other diseases that people are vaccinated against, evolves antigenically over time, causing the effectiveness of vaccines to vary each flu season (Lewnard & Cobey, 2018). Even with this sporadic effectiveness, a systematic review and meta-analysis of more than 30 studies showed that the vaccine can
provide moderate overall protection against infection and illness (Osterholm et al., 2012). One meta-analysis showed that out of 10 randomized controlled trials that addressed the trivalent vaccine specifically over 12 influenza seasons, the trivalent vaccine had significant efficacy for eight of the seasons, whereas it did not for four (Osterholm et al., 2012). The median vaccine efficacy was 62% for the 10 studies in the systematic review by Osterholm et al. (2012).

In seasons where vaccines were well-matched to circulating strains, vaccines had as high as 70%–90% effectiveness in the prevention of influenza in healthy adults (Osterholm et al., 2012). In other years, flu vaccine effectiveness was as low as 31% (Rondy et al., 2017). However, these figures included the elderly population, which skewed the results. Vaccine effectiveness was generally higher in those under age 65, with pooled efficacy in the age group under 65 years of age at an estimated 51% (Rondy et al., 2017). One meta-analysis showed that the most frequently reported barrier reported for the public was “attitudinal beliefs such as decreased perceived effectiveness” and “a lack of trust in the health authorities” (Schmid, Rauber, Betsch, Lidolt, & Denker, 2017, p. 19). With this challenge in place, health professionals must examine how to educate and motivate college-age students to get a yearly flu vaccine when they are old enough to make their own decisions.

There are several factors that affect the mindset of a traditional college student about whether to get a flu vaccine. In 2017, there were more than 17 million undergraduate students enrolled in the United States (Schmid et al., 2017). In 2014, approximately 72% of undergraduate students took classes in the traditional classroom setting with an additional 14% taking classes both in-seat and online; the remaining took classes in an online-only environment (Postsecondary Success, 2014). The student population was mostly under the age of 21, with 55% of the total population falling into that category and 27% between ages 22 and 29.
(Postsecondary Success, 2014). While diversity is increasing, the majority (56%) were White, followed by 18% Hispanic and 14% Black (Postsecondary Success, 2014). Sixty-two percent of students were enrolled full-time, and 46% lived on campus (Postsecondary Success, 2014). Studies have shown that 33%-70% of college students experienced stress due to financial concerns (Bennett, McCarty, & Carter, 2015). Costs were an issue for 22% of students in a recent survey who agreed with the statement: “Vaccines are too expensive for me right now” (Benjamin & Bahr, 2016, p. 4).

Purpose of the Study

The purpose of this project was to examine a local university’s health clinic influenza vaccination program and to explore the effects of partnering with a local pharmacy to overcome billing issues. Specifically, I conducted a program review of a private faith-based university’s health clinic’s flu vaccination activities from 2012 through 2017, and compared the findings with results from 2018, when the pharmacy partnership and mobile flu shot clinic took place. I completed analyses using the Six Sigma DMAIC (define, measure, analyze, improve, and control) roadmap to determine if the partnership with a local pharmacy had a significant impact and should continue in future years.

Significance

In order to achieve herd immunity, a community must have at least 80% vaccination against a disease (Nies & McEwen, 2015). With only an average of 20% of U.S. colleges vaccinated to prevent influenza, the risk of outbreak is significant on campus (Monn, 2016). The CDC stated that “anyone can get the flu, even healthy people, and serious problems related to flu can happen at any age” (2018, para. 7). It is therefore important to increase the number of college students vaccinated on campus to improve outcomes and overall public health. A combination of
many small changes is necessary to impact the number of vaccinations of undergraduate students due to the complexities of motivation and perceived barriers at play.

Through this project, I examined whether the barrier of out-of-pocket cost for flu vaccines could be overcome by inviting the local branch of a national pharmacy chain onto campus to offer a mobile health clinic that billed private insurance. Because the pilot expansion demonstrated significant improvement in the number of vaccines given on campus, other colleges or universities could also examine partnering with local or franchised pharmacies as an extension of services that would increase their immunization rates, potentially improving the public health of college students across the nation. I published the results along with the program evaluation and outcomes of the partnership to guide other health clinics on campuses across the United States and even abroad.

Nature of the Project

One of my goals in this project was to provide recommendations to increase the number of college students vaccinated on campus, and specifically to examine the pilot project with the pharmacy compared to previous years when this option was not available to students. I chose a small private university’s health clinic for this program evaluation due to the relationship that I as the researcher had with the university as full-time faculty. I completed an overview of the program to examine past vaccination rates and detailed aspects related to their vaccine program for influenza. Additionally, I analyzed barriers and obstacles within this specific program.

In the initial review, I discovered that the health clinic did not bill insurance for the cost of the vaccines and students must pay out of pocket for the influenza vaccine on campus. The director of the on-site health clinic noted being previously approached by a local pharmacy offering to partner with the college to offer a mobile flu shot clinic to students and bill most
insurances, thus covering the vaccination at 100% as a preventative service for many of the students. Once data were collected from the pharmacy flu vaccination clinic, I made recommendations that this should be a permanent program change based on how many students took advantage of the mobile flu shot option.

**Question Guiding the Inquiry: PICOT Question and Hypothesis**

For the project at hand, the patient population was undergraduate college students. The intervention was partnering with a pharmacy to offer a flu vaccination clinic that would bill student insurance. The comparison was against the usual practice of offering influenza vaccinations only within the health clinic and for an out-of-pocket expense. The desired outcome was to increase the number of flu vaccines given to students on campus. The hypothesis was that offering flu vaccines through a mobile pharmacy that would bill insurance would increase the number of college students obtaining a flu vaccination.

**Research Question**

A key factor in this project was to develop a defined research question. The method I used was a PICOT (population, intervention, comparison, outcomes, and time frame) question (Moran, 2017). The population for this project was undergraduate students on a private university campus. The intervention for this project was the addition of a pharmacy flu vaccination clinic for the 2018–2019 flu season. The comparison was to the usual practice of the health clinic charging students out-of-pocket for flu vaccinations. The outcomes were measured as the number of undergraduate students who obtained a flu vaccine on campus. The time frame was September 2018 through February 2019. The PICOT question for this project was as follows:
Q1. On a private university campus, how does collaboration with a pharmacy for a flu vaccination clinic affect the number of undergraduate students who obtain a flu vaccination on campus within the time frame of the flu season (September through February) compared to the usual practice of offering flu vaccination only in the health clinic as an out-of-pocket expense?

**Theoretical/Conceptual Framework**

The theory of planned behavior (TPB) supported the theoretical foundation for this project (Agarwal, 2014). This theory corresponds well with the issue of how college-age students respond to health promotion activities such as education, marketing, and increased convenience as motivations to get the vaccination and decrease the chance of getting the flu. The TPB guided recommendations for future marketing of the flu shot clinics for students. This theory builds on the “assumptions that individuals can rationally evaluate their options and beliefs associated with a behavior before formulating their intention to perform the behavior” (Agarwal, 2014, p. 417).

The TPB has three determinants that predict behavior: attitude toward a behavior, subjective norms of behavior, and perceived behavioral controls. The TPB is a useful model for public health issues but has some limitations over environmental and economic influences (LaMorte, 2018). Another limitation of this theory may include addressing the time frame between intent and actual behavior, which can be a factor for college students who intend to get a flu vaccine but never get around to it (LaMorte, 2018). Regardless of the limitations, the TPB is a well-respected theory that could be used to help guide purposeful marketing and health promotion activities for future mobile flu shots (Schmid et al., 2017).

Many researchers have utilized the TPB in examining vaccine behavior (Schmid et al., 2017). In a systematic review of the use of the TPB as a behavior change framework for studies involving influenza vaccination, Schmid et al. (2017) noted that it was the second most often
used theory to predict health care workers’ intentions toward influenza vaccinations. Agarwal (2014) examined the application of this theory while examining college students’ vaccine intentions and how self-efficacy would impact or predict their behavior toward the flu shot. In another systematic review, Schmid et al. (2017) discussed how the TPB can provide psychological insights that help explain why some people choose to get vaccinated against the flu whereas others do not. The authors explained how health behaviors are associated with intention and may be influenced by the “concepts of risk perception, past behavior, knowledge, and experience” (Schmid et al., 2017, p. 3). Lastly, Mattson (2014) utilized the TPB to examine mindfulness on influenza vaccination, indicating that past behaviors may play a role in predicting future behaviors.

I employed the Professional Nursing Practice and Development Framework (PNPDF) to guide the project. The PNPDF consists of three interconnected concepts that include (a) contribution to the patient, (b) contribution to the profession, and (c) contribution to society (Mensik, Martin, Scott, & Horton, 2011). An illustration of this framework can be found in Figure 1. Although the patient is placed in the center of the figure, this represents individuals, families, groups, and even communities as the center of focus and primary commitment of the PNPDF (Mensik et al., 2011). For this project, the term *patient* represented the aggregate group of undergraduate students attending the same university.
Definition of Key Terms

Key terms are relevant and significant words used in a project paper. Definitions of key terms are requisite for formal papers. I used the following key terms, listed and defined below, in this paper.

Attitude. Attitude is defined in relation to the TPB as “a person’s overall evaluation of performing the behavior in question” (Agarwal, 2014, p. 420).

Campus. The campus is the grounds and buildings of a university, college, or school (“Campus,” 2018).

Clinic. A clinic is an institution, building, or part of a building where ambulatory patients receive health care heal (“Health Clinic,” n.d.).
**Faith-based university/college.** A faith-based university/college is a college or university guided by missions that are informed or motivated by faith or religious convictions (Daniels & Gustafson, 2016).

**Influenza vaccine effectiveness.** Influenza vaccine effectiveness is “a relative reduction in influenza risk in vaccinated individuals in observational studies that used medically attended, laboratory-confirmed influenza as the primary outcome of interest” (Osterholm et al., 2012, p. 37).

**Influenza vaccine efficacy.** Influenza vaccine efficacy is “the relative reduction in influenza risk after vaccination as established by a randomized placebo-controlled clinical trial” (Osterholm et al., 2012, p. 37).

**Perceived behavioral control.** Perceived behavioral control is an “individual’s perception of their ability to perform a specific behavior” (Agarwal, 2014, p. 420). For this project, the behavior under study was that of obtaining a flu vaccine.

**Private university.** A private university or college is an “independent school that sets its own policies and goals and is privately funded” (Lauryn, 2017, para. 1). Typically, private universities have smaller enrollment than public or state universities (Lauryn, 2017).

**Subjective norms.** Subjective norms are a “measure of family and friends’ approval of the behavior” (Agarwal, 2014, p. 420).

**Undergraduate.** An undergraduate is a student at a college or university who typically has not received a first, and especially a bachelor’s, degree (“Undergraduate,” 2018).

**Vaccination.** A vaccination is an injection of a killed or live microbe in order to stimulate the immune system against the microbe, thus preventing disease (MedicineNet.com, 2016).
Scope of Project

The scope of the project was limited to analyzing health services related specifically to undergraduate students on a private faith-based campus of approximately 1,400 traditional students taking in-seat classes. For the project, I analyzed the portion of the program offered by the health clinic specifically related to influenza vaccinations and observed the impact of adding a partnership with a pharmacy. I collected data from the health clinic regarding students who obtained the flu shot either in the clinic or from the mobile flu shot clinic. I did not collect overall vaccine rates due to the complexities of obtaining accurate data from surveys of college students.

Summary

This project entailed partnering with a private faith-based university’s health clinic in order to review its past practices of offering flu vaccinations as part of its program of services. Specifically, I analyzed the addition to the program of having a local pharmacy come to the campus to determine its role in future programs and if it should be a permanent extension of services or not. I compared vaccination numbers from 2012–2017 to the pilot clinic’s 2018–2019 flu season to see if the additional option for students created a significant increase in vaccinations given.

College students make up a unique aggregate group of the population with distinct challenges and thoughts. Each generation shapes its own views of health promotion and disease prevention, as evidenced by the decennially changing goals of the Healthy People 2020 objectives (HealthyPeople.gov, 2018). The interventions from this project worked in conjunction with the Healthy People 2020 goal but were aimed specifically at college students, on whom the Healthy Campus 2020 Initiative focused. Continued research is needed to demonstrate which
interventions are most effective with this aggregate group and how to best influence, educate, and motivate them into action to obtain a seasonal flu vaccine and understand the value and importance of disease prevention. This project provided research that analyzed the impact of bringing in a mobile flu shot clinic to overcome the cost barrier for undergraduate college students on a small private college campus in a western U.S. state.
Chapter 2: Literature Review

Introduction to the Problem and the Research

Typically, 5%–20% of the U.S. population contracts influenza each year (Monn, 2016). While the CDC recommends annual flu immunizations, typically less than 42% of the population and less than 20% of college students receive the immunization (Monn, 2016). I conducted a literature review to provide a scientific basis for the proposed project, to explore the concept, and to provide a reference for recommendations.

I used the Abilene Christian University (ACU) online Brown Library and the ACU OneSearch engine to find literature. The library databases were vast and included CINAHL Complete, Health Source: Nursing/Academic Edition, Medline EBSCO, Medline FirstSearch, Medline PubMed, and Science Direct. I entered the terms college students and flu vaccines with parentheses around them into the search engine. I filtered the inclusion criteria to show only scholarly reviewed full-text articles in academic journals in the English language with a publication date range of 2013–2018. As of February 2018, when the literature review was conducted, 25 results were shown. I selected only those that gave information regarding material pertinent to the project, prioritizing studies that used the theoretical premise of the TPB.

After reviewing the articles and synthesizing material, I found three relevant areas of research regarding these topics. First, a theme of using the TBP was prevalent in research to explore the rationale of why students do not get vaccinated; therefore, a portion of the literature review focuses on the mindset of students in relationship to the flu vaccination, using the TBP to explain human tendencies. Secondly, through the literature review, I explore interventions to see which, if any, were most effective in increasing vaccination rates for influenza among college students in the undergraduate setting. Third, through the literature review, I explore which types
of framing of a health promotion message were most effective with college students for marketing. I utilized this material for framing how to carry out interventions most effectively and make recommendations for future communications with students. Additionally, the literature review includes research on the impact of location and the use of mobile clinics as an option on college campuses to expand options for students to obtain vaccinations.

**Attitudes of Students Toward Influenza and Vaccination**

A pattern in many studies was the premise that influenza vaccine uptake among college students is very low because college-age students are likely to perceive themselves as healthy and, thus, have a lower motivation to get vaccinated. For example, Bednarczyk et al. (2015) performed a cross-sectional study of 600 students who visited the university health center and completed a self-administered, anonymously written survey. The survey asked students about recent influenza vaccination, barriers to influenza vaccination, and willingness to get vaccinated to protect other vulnerable individuals they encountered. Among the unvaccinated, the most common barrier was a self-admitted factor of being “too lazy to get the vaccine” (32%; Bednarczyk et al., 2015, p. 1659) followed closely by the belief that “I don’t need to get the vaccine because I am healthy” (29%; Bednarczyk et al., 2015, p. 1659). Additionally, some of unvaccinated students in this study listed cost as the primary barrier to not receiving a flu shot (6%; Bednarczyk et al., 2015).

Researchers have generalized the attitudes of university students to understand why college students may not get vaccinated. Bednarczyk et al. (2015) documented attitudes common to college-age students; I considered these findings when deciding which recommendations to make to the program. For example, because laziness is a factor for college students, I recommended that the mobile clinic be set up in an area of high convenience to improve chances
of uptake for the vaccination. The concept of bringing a mobile flu shot clinic with no appointment necessary to the student center is an example of how the project addressed convenience and overcame the issue of having to plan on making an appointment at the health center. Additionally, because a large number of students do not get vaccinated because they think of themselves as healthy and not needing the flu vaccines, it was important to point out in the marketing of the event that they might contaminate someone who could have a more significant reaction, such as an immunocompromised roommate, a grandparent, or a baby. Bednarczyk et al.’s (2015) findings were helpful to determine prevalent attitudes and make specific program recommendations to the health clinic.

Researchers that examined, through the lens of the TPB, why people do not get vaccinated were of value to this project to understand the big picture of societal vaccine hesitancy. One systematic review addressed influenza vaccine hesitancy between the years of 2005 and 2016 (Schmid et al., 2017). This article was a level 1 systematic review and meta-analysis of the topic at hand and provided a high level of research. The review covered 13 databases and more than 470 articles to explore barriers affecting influenza vaccination intention and behavior, offering a strong comprehensive view of barriers to getting immunized. A limitation of this systematic review in relationship to the proposed project was that the research was not specific to the college-age population, which was the population of focus for this project. The study gave only general feedback on the public’s attitude toward influenza as a disease and the vaccine. However, this was still valuable, especially because Schmid et al. (2017) explored the process through the TPB, the selected theoretical approach for this project. Frequent negative attitudes “such as a decreased perceived effectiveness of the vaccine and a lack of trust in health authorities” (Schmid et al., 2017, p. 19) were cited as barriers to getting vaccinated. The research
suggested that complacency, or low perceived risk, was a common barrier to receiving vaccination, followed by low confidence in the actual vaccine and the authorities; therefore, it may be beneficial to work toward building trust with students and providing more education on the effectiveness of the vaccine.

A systematic review by Hashmi et al. (2016) supported the previously cited macrolevel issue of complacency as a frequently cited barrier, stating that many studies showed low worry, low perceived risk, and severity of the disease as reasons of not getting immunized against the flu. Multiple studies documented a pattern of low motivation among college students to obtain a vaccine. Hashmi et al. (2016) concurred with these findings, reporting that 39% of undergraduate students had an overall attitude of apathy, using self-descriptive terms of carelessness, laziness, or business as explanations of why they did not get the flu vaccine. This complacency made it challenging to get the students to take the initiative to get a flu shot and take other primary prevention steps. Thus, a call to action may be needed to show that preventative medicine is a responsibility of young adults in college. The convenience of a mobile on-campus flu shot clinic may help students overcome barriers, such as driving to a pharmacy to obtain their flu shot or making an appointment with a primary care provider, and decrease the likelihood of complacency.

Several researchers have investigated student attitudes toward getting flu vaccines and identified the complexities that make this group so challenging to motivate to action. Beliefs such as “I am healthy and don’t need the vaccine” were prevalent among students (Bednarczyk et al., 2015, p. 1661). Other common issues were apathy, cost, fear of needles, and inconvenient locations (Bednarczyk et al., 2015). Researchers have also documented a lack of knowledge among college students regarding flu vaccinations (Hashmi et al., 2016). Such research exposes
the complexities of this group in relationship to their attitudes and motivations regarding obtaining a flu vaccination while at college, making improving outcomes a challenge. Collectively, college students represent a demographic that is “notoriously difficult to vaccinate against the flu” (Lawrence, 2014, p. 425).

These studies demonstrate underlying attitudes toward influenza and the many reasons that a college student might not get vaccinated. Any project to improve vaccination rates must address the underlying challenges of appealing to the market of college-age students. Despite recommendations by the CDC, news reports of epidemic outbreaks of the flu, and the high availability of flu vaccines at a low cost, many colleges still have low vaccination rates among undergraduate students (Shropshire, Brent-Hotch Kiss, & Andrews, 2013).

**Interventions That Effectively Increase Flu Vaccination Among Students**

Specific interventions have been identified as potentially effective in increasing flu vaccination rates among the target aggregate group: undergraduate students. Several themes emerged: (a) provider education, (b) media (social media, college web portal, wellness newsletters, posters, and so on), (c) immunization clinics, and (d) provider recommendations (Monn, 2016). The National Foundation of Infectious Disease (NFID, 2016) recommended (a) building solidarity among college, professional, and student organizations to highlight the importance of flu prevention; (b) encouraging uptake of flu education and vaccine resources to raise awareness; (c) instilling the flu vaccination habit early as part of college readiness; and (d) making flu vaccination accessible through college health services for students. Other researchers found that economics played a role in motivating students, reporting that financial incentives, even as small as $10, and peer endorsement may be effective ways to increase flu vaccinations among college students (Anskis, 2014).
Another important consideration is timing and convenience. Many students have good intentions to get vaccinated (25%), but only a small portion carry out the desired act (9%; Anskis, 2014). Similarly, Bronchetti, Huffman, and Magenheim (2015) tested interventions in a randomized controlled trial and found that a financial intervention of $30 per patient raised vaccination rates by 34% and had more significant impact on peer endorsement. However, implementing this recommendation can be challenging due to the financial limitations of most college health centers. Overall, convenience and cost affected student intentions to get vaccinated.

**Framing Messages to Students to Increase Motivation**

Communication with college students is important to motivate, educate, and incentivize this population to take action. Researchers have examined how health promotion campaign messages should be phrased to have the most impact. Agarwal (2014) performed a cross-sectional study using the TPB and a correlational design of volunteer undergraduate communication students at a midsize metropolitan university. Agarwal claimed to be the first to demonstrate that the TPB applies to college-age students by examining topics of self-efficacy and perceived comparative susceptibility in relation to student intentions regarding obtaining a flu vaccine (2014). She concluded that communications should underscore individual choice and how it is an act of responsibility, as well as highlight positive beliefs regarding usefulness and benefits. She utilized the same theoretical approach as I did in this project. Suggestions from Agarwal can be used to craft mass media messages to students using the TBP that would most likely impact and motivate them to act to obtain a flu shot.

Mass media campaigns are often used to reach students in more appropriate and meaningful ways that are relative to the millennial generation. Shropshire et al. (2013)
concluded, “When the mass media campaign was coupled with other forms of promotions and marketing initiatives, students indicated that the campaign encouraged and strongly influenced their decision to obtain the vaccination.” (p. 441). Yu and Shen (2013) specifically looked at the effects of message framing and cultural appeals. They found that both U.S. and Chinese participants responded most significantly to messages that presented individualistic gains and collective losses. An example of a message of individual gain would be “Getting a flu shot may benefit you,” whereas a collective loss message might emphasize how skipping a flu shot could put many at risk. Yu and Shen showed that the collective loss message actually had the most significant impact on students’ desires to be immunized. Their findings demonstrated that while young adults might see themselves as invincible and not take action, college students may be altruistic and ultimately willing to immunize themselves to help prevent harm to others who are more fragile or susceptible to the virus. The information from this study could be very useful for media messages and wording posters that could be used to promote mobile flu vaccination clinics.

**Offering Flu Shot Clinics in a Variety of Locations, Including Mobile Clinics**

I conducted a separate literature review to complete additional research to evaluate specific program elements such as the mobile flu shot clinic. First, I searched the term *mobile clinic* to the other two search terms, *college students* and *flu vaccination*. I hoped this new search would find research that added the component of partnering with a pharmacy to provide a campus-based mobile flu clinic as an option for students. I then completed a search within the ACU’s online Brown Library and PubMed and selected additional articles to provide evidence from studies that incorporated the use of some kind of mobile clinic or billing alternative to address flu vaccination in a community setting. This was important because administrators of the
program at the university where I conducted the study was considering expanding the program for the current flu season to include a partnership with a local pharmacy that could provide a mobile clinic option for students.

A part of my project review included an analysis of whether collaboration with a local pharmacy to provide an on-site mobile health clinic that would bill student insurance would increase the number of on-campus flu vaccinations compared to previous years when this service was not used. Thus, a search for the term mobile clinic was added to the search criteria of flu shots and college student to narrow and specify needed research selections. One article that was applicable and fitting for the project was “Using Mobile Health Clinics to Reach College Students: A National Demonstration Project” (Fennell & Escue, 2013). This article specifically addressed how a mobile health clinic could be used to provide health promotion and clinical services for college students in the United States and fit perfectly with the population for this study—undergraduate students. The researchers also examined out-of-the-box ideas about how to reach this challenging demographic other than through the traditional university health clinic, giving options to students.

Fennell and Escue (2013) provided valuable details on how mobile clinics could be used to reach college students. For example, the mobile clinic in their study parked in a variety of convenient locations for students. The mobile clinic was not exclusively for influenza vaccinations; vaccinations were just one of the services that were provided and analyzed. The health clinic partnered with the Department of Nursing on campus to provide the mobile clinic in addition to the on-site university health clinic already in place and offering vaccines. Four clinics of 3 hours each were offered for a total of 12 hours of outreach time. Nursing students in the community health clinical rotation administered flu vaccinations to students in four residential
halls and in the mobile clinic, which was parked next to the dining hall. The university handled charges for these vaccines by billing student accounts rather than having students pay out of pocket directly at the time of service. The fee added to their account for the vaccine was $20.

In conclusion, the study findings provided valuable information about offering options outside the doors of the on-campus health clinic location. The year before the mobile flu shot clinic was put into use, nurses at the student health clinic gave 175 influenza vaccines to students on campus, compared to 431 during the following season with the extension of the mobile health clinics. While more research is needed on mobile or pop-up clinics for the use of health promotion and disease prevention activities, the researchers concluded that “mobile clinics could possibly serve unmet health needs on regional campuses” (Fennell & Escue, 2013, p. 346). The study validated the idea of offering other locations around campus for the mobile clinic to set up besides the health clinic, increasing convenience and options for students.

Examinations of school-based clinics in the literature provided evidence related to the program of study for this project about administering vaccinations in a school-based health clinic. For example, Daley et al. (2014) assessed whether a school-located adolescent vaccination program that billed health insurance would cover program costs, looking at the proportion of cost reimbursement and the likelihood of vaccination. Daley et al. (2014) completed this research in the school-based health clinics in the Denver area of Colorado, which is also in a western state within the United States. An important difference was that this study was done on elementary and middle school campuses rather than on a college campus. Thus, the outcomes may not be directly comparable. Additionally, Daley et al. looked at many types of vaccines and not only the flu vaccine. Overall, the authors concluded that that school-located vaccination of adolescents with insurance billing was feasible and was associated with higher vaccination rates than those in
control schools where this service was not offered (Daley et al., 2014). I used the study minimally in this project because it did not specifically address flu vaccinations, though it did address the convenience issue of insurance billing and overcoming the barrier of fees related to cost of immunizations, which is directly related to the intervention of partnering with a local pharmacy for billing options.

The last article of importance for my analysis of mobile health clinics and school-based health clinics was a systematic review that resulted in a community guide for preventative services, written by the Community Preventative Services Task Force (CPSTF; 2015), titled *Vaccination Programs: Community-Based Interventions Implemented in Combination*. The task force searched a broad database for the terms *immunization*, *vaccination*, and *immunization programs* (Community Preventative Services Task Force, 2015). A total of 18 studies were evaluated, 17 of which were published between 1980 and 2010; the other was published between 2010 and 2012. All of the studies showed some measurable change due to a vaccination program and a median increase in vaccination rates of 14% (Community Preventative Services Task Force, 2015). This figure was useful for setting realistic goals for program outcomes.

The program the task force evaluated used client reminder and recall systems. Some programs involved partnerships between community organizations, local government, and vaccination providers and included one of the following: expanded access in health care settings, home visits, or reduced client out-of-pocket expenses (Community Preventative Services Task Force, 2015). Several of the interventions in community-based programs were resource-intensive, using manual outreach.

An important conclusion from this systematic review was that partnerships can be of great value in community settings for increasing vaccination rates, especially with existing
vaccination providers. This information was applicable to the PICOT question and focus of the intervention for this project of collaborating with a local pharmacy that provided immunizations. Four of the studies the task force evaluated showed that community coalitions benefitted through that partnership (Community Preventative Services Task Force, 2015). The CPFTS’s systematic review and guide provided valuable insight for the project, demonstrating the value of partnerships, and could be useful for making specific recommendations for change that may improve future outcomes of preventative health measures directly related to flu vaccination.

**Vaccine Efficacy and Historical Data**

I added *Influenza vaccine effectiveness* as a separate search phrase in order to discover the historical relevance and efficacy of the flu vaccine within the past 5–10 years. I choose articles for their usefulness in relation to discussing pooled data and year-to-year rates of flu vaccine efficacy. This was an important concern to address and acknowledge in a project related to the influenza vaccine. These additional searches added breadth to the research and enhanced the comprehensiveness of the project.

It is important to address and understand the challenges associated with flu vaccination in relationship to its historical efficacy against the influenza virus, as college students may factor into consideration what they hear about vaccination efficacy when deciding if they should obtain a flu vaccine or not. There are many complexities in deciding on the content of and producing flu vaccine. Unlike other viruses that have more consistent properties, the flu virus has many strains. Historically, the antigens present in flu vaccine have not been well matched to some of the strains of flu active in that particular season. Lewnard and Cobey (2018) explored the imperfect mismatch that can occur with flu vaccines and their variable effectiveness. Other researchers have discussed the complexities of manufacturing the vaccine in addition to predicting
circulating strains (Daley et al., 2014). Health clinic providers must be able to educate students on this information; thus, flu vaccine efficacy and vaccination rates could be of value to health clinic providers when recommending vaccinations to students or conducting a question-and-answer session.

Another study that was directly applicable to this study and provided a high level of research was the systematic review and meta-analysis by Osterholm et al. (2012). The researchers touted that it was the first published meta-analysis that “assessed efficacy and effectiveness of licensed influenza vaccines in the USA with a sensitive and highly specific diagnostic test to confirm influenza” (Osterholm et al., 2012, p. 36). Strengths of the meta-analysis were that the researchers screened a large number of studies (5,707) before they identified the optimal 31 for inclusion. The final meta-analysis included 17 randomized controlled trials and 14 observational studies (Osterholm et al., 2012).

In summary, this systematic review showed that the efficacy of the trivalent inactivated vaccine (TIV) was clear in eight of the 12 seasons assessed (Osterholm et al., 2012). The pooled efficacy was 59% in adults aged 18–65, and the median vaccine efficacy was 62% (Osterholm et al., 2012). One noted limitation of this research was that the population was broad and did not focus on 18–26-year-olds. Overall, the article was helpful to the project because it demonstrated that even though there may be varied efficacy over the years, the flu vaccine was still an effective means of decreasing flu complications and infection rates.

The last commentary I used for the discussion of vaccine effectiveness was Rondy et al.’s (2017) systematic review and meta-analysis found in the PubMed search. Their review addressed studies that were conducted between 2009 and 2016, were found in PubMed, and used “a test-negative design (TND) to enroll patients hospitalized with influenza-associated conditions”
(Rondy et al., 2017, p. 381). Rondy et al. (2017) identified a large number of studies (3,411), of which 30 met the criteria for inclusion. The summary of this meta-analysis was that influenza vaccines provided moderate protection against influenza-associated hospitalization in adults (Rondy et al., 2017). The researchers did not study the population of college-age adults as a separate category but lumped them into the 18–64 age category. However, the researchers provided a high level of research by analyzing a large number of studies before concluding that influenza vaccines could prevent nearly half of all laboratory-confirmed hospitalizations associated with the influenza virus (Rondy et al., 2017). The study was therefore a recent, reliable source for data and analysis pertinent to the project at hand. The data and evidence could be useful for educational purposes to help students find value in the flu vaccine and decide that its effectiveness is sufficient to warrant the time, effort, and money needed to immunize against the flu.

**Theoretical Framework Discussion**

The TPB explains behaviors over which people have the ability to exert self-control (Argarwal, 2014). As new adults, most college students have a newfound freedom to make their own decisions over what actions they will or will not take or prioritize. Attitude plays a crucial role in intent, and intent plays a role in actions. Some students come to college with belief patterns from their parents about flu vaccines. They must decide if they will continue to base their actions off the beliefs of their parents or if they will independently decide how they feel regarding preventative health issues. The TPB corresponds with the idea that the greater the intent, the greater the likelihood of performing a behavior (Agarwal, 2014). Young adult students must perceive the flu vaccine as valuable in order to act and to consent to take it.
Marketing messages to students can be purposeful to highlight the value of the vaccine and why it is important to them. Subjective norms may also play into student decisions. The TPB describes subjective norms as often being the expressed beliefs of close friends or family in the approval or disapproval of the behavior (Agarwal, 2014). Therefore, if the parents encourage students to obtain a flu vaccine and students hear that many of their roommates are getting the vaccine, then they may be more likely to carry out the behavior as it becomes a social subjective norm. Agarwal (2014) stated that individuals are more likely to obtain a vaccine if they perceive that those around them hold positive beliefs regarding getting vaccinated. The messages chosen to promote flu shot clinics could be based on this information and include phrasing such as, “Don’t let your roommates down. Do you part and get immunized.” Overall, there are many factors that influence the behavior of young adults because they are new at making independent decisions on their health care. But using the TPB helped to guide me on how to reach these students.

**Conceptual Framework Discussion**

I used the PNPDF conceptual framework to guide the planning and implementation of the scholarly project. The framework demonstrates the conceptual relationship between the patient and excellent care. In this model, the nursing process is used primarily in regard to the concept of contribution to the patient. Evidence-based practice and research, as well as professional practice evaluation, are components of the contribution to our profession layer that this project incorporated. Lastly, factors highlighted within the contribution to society are timely, effective, efficient, equitable, and safe. The program for the flu vaccinations offered through the health clinic and partnership with the pharmacy met all of these components, contributing to society. In this project, I examined how increasing flu vaccination is beneficial for the patient and for
society. The project adds to the professional works available on this subject and thus contributes to the profession.

**Summary**

In conclusion, this literature review provides a solid foundation for looking at the issue of low college vaccination rates and how to improve them on college campuses. While research is not definitive on how this problem should be handled, many studies provide background on the psychology of college students and their understanding of health promotion behaviors. Because epidemiological studies indicate that young adults in college settings are at high risk of contracting influenza, it is imperative that more research be done on effective means of reaching this group and the calls to action that are of highest benefit. While there may be no one-size-fits-all approach, the research I utilized examined college students’ attitudes toward the influenza disease and vaccine, interventions that may be effective, and how to best frame health promotion messages to college students. Additionally, the literature review provides a basis for recommendation for the university’s influenza health program based on evidence, past studies, and a history of improved outcomes that could be of great value.
Chapter 3: Methodology

Planning for Measures to Improve Primary Prevention

A comprehensive health care program includes primary prevention, but often the outcomes and program interventions are not evaluated thoroughly. The university where the project occurred offered influenza vaccinations on campus through their health clinics within the appropriate timing of the flu season, typically September through the end of February. A program evaluation can generate valuable data on improving outcomes, including analyzing the pilot program of the pharmacy partnership for a mobile flu shot clinic (CDC, 2012). Although some college students received their influenza vaccines off campus or from a primary care provider, this project specifically focused on improving uptake of flu vaccine on campus through the health clinic program and a pharmacy mobile clinic option only.

For this study, I gathered historical data on the number of flu shots given at the health clinic each flu season between the years 2012 and 2018. For simplicity, the year when the flu season starts, 2012, was used for the comparison, although the flu season extended through spring of the following year (thus the data could have been labeled as the 2012–2013 flu season). I used the number of students enrolled in the undergraduate program each year to find the percentage of uptake of flu vaccine on campus annually. I then used the data to determine if the portion of the program specific to the partnership with the local pharmacy was significant.

Finally, I completed an analysis of the value of having the pharmacy mobile clinic in light of the effort it required and challenges it created, and I made recommendations for the health clinic flu vaccination program. It is possible that other college universities that have similar challenges with billing of vaccines could examine this study and the results to determine if this option is of value to them as well or if they should expand this research.
**Project Design**

A nonexperimental research design was used for this scholarly project. The CDC (2012) explained that “program evaluation is one of ten essential public health services and a critical organizational practice in public health” (para. 10). Therefore, I evaluated the pilot partnership as part of the health clinic’s influenza vaccination program. I obtained approval from the health clinic director on campus for permission to review the program and gather data. I obtained institutional review board (IRB) approval from the host university in November 2018. The program review was considered exempt.

I completed the evaluation of the university’s health clinic influenza immunization program utilizing historical data from 2012–2017 and data from 2018, when the pharmacy mobile clinic was added. The CDC (2012) stated that the framework for such a program evaluation should include engaging stakeholders, describing the program, focusing on the evolution design, gathering credible evidence, justifying conclusions, and sharing lessons learned. I shared the lessons learned with the stakeholders for this project: the health clinic director and administrators of the university. The CDC (2012) affirmed that program evaluation can have merit, worth, and significance.

**Instrument/Measurement Tool**

The scope of the project was to integrate all data relative to the university’s health clinic program specific to influenza vaccinations (CDC, 2012). Standards of the program evaluation included addressing utility, feasibility, propriety, and accuracy (CDC, 2012). I collected descriptive data and put it into a table. Next, I calculated the percentage for flu vaccine uptake for each year between 2012 and 2018. Lastly, I conducted a two-proportion z test to examine if there was a significant difference in the average percentage of flu vaccine given on campus for
the years when only the health clinic option was available with out-of-pocket billing versus the year that the pharmacy mobile health clinic was added to offer insurance billing for students.

In addition, I completed my program analysis using a portion of the Six Sigma methodology for quality improvement that included the five stages of the DMAIC roadmap (define, measure, analyze, improve, and control (Moran, 2017). Six Sigma is a business methodology that has been used by health care organizations to increase satisfaction, streamline operations, and improve quality (International Six Sigma Institute, 2018). The initial phase, define, was used to summarize the project, focusing clearly on problems in place (Rastogi, n.d.). The next step in this process, measure, included the collection of relevant data by quantitative and qualitative means (Rastogi, n.d.). Once this was completed, the next step, analyze, occurred with the objective of examining program inefficiency and gaps between goal versus actual performance (Rastogi, n.d.). Then the phase—improve—helped to determine potential solutions and ways to implement them and gave an action plan for the stakeholders (Rastogi, n.d.). The last phase, control, was to delegate future decisions to the program director and the university administration once the project was completed. During this transitional phase, recommendations were made, but the option for future continued evaluation went back to the program staff (Rastogi, n.d.). The focus of this method, to improve quality, was an effective method for this nonexperimental designed project (Moran, 2017).

Data Collection, Management, and Analysis Plan

I collected data for analysis and outcome-based evaluation. Specifically, I gathered records and invoices from the university’s health clinic to find the number of vaccines ordered and the number of vaccines returned, if any, for each flu season dating back to 2012. Records were available only back to 2012 due to changing of directors at that time and shredding of older
documents. Analysis of these invoices and records demonstrated how many influenza vaccinations were given each year at the health clinic.

It was necessary to determine the distribution of these vaccines to staff versus students. I deciphered this by searching through the flu vaccine consent forms that were filed within the clinic and noting the number that were for staff versus for students. It was important to maintain the confidentiality of the names on these forms; thus, I used only aggregate numbers for this study. Data for the number of vaccines ordered were taken from invoices. I noted the number of vaccines returned, if any, at the end of the season. Patient names were visible on the consent forms, but only I, in partnership with the clinic director, sorted the consent forms. Once the consent forms were separated into the categories of students versus staff, no names were collected for the project or paper; only the total number of students who obtained a vaccine within the health clinic or pharmacy mobile clinic was documented.

I evaluated vaccine numbers by season, starting in September of each school year and ending in February to constitute one flu season. The clinic director reported that there had historically been no uptake of influenza vaccines after the month of February and she usually returned any vaccine left during the months of March or April. During some flu seasons, a limited supply of influenza vaccine may have inhibited additional ordering of product beyond December. The director reported this had not been a significant inhibitor for the program. Rather, many of the years, vaccines were over-ordered and even returned to the manufacturer at the end of the season.

The partnership with a local pharmacy to offer a mobile flu shot clinic occurred only in 2018. I conducted a two-proportion z test to examine whether there was a significant difference between the proportions of average uptake of flu vaccine given on campus during the years
2012–2017 and the uptake of flu vaccine on campus with the pharmacy extension during the 2018 flu season. Additionally, I created a bar graph to provide a simple visual demonstration of the change in uptake of vaccine for 2012–2018. I used these numbers to analyze if a significant percentage of students utilized the service offered or not. This allowed for recommendations to then be made such as

1. Should the pharmacy be invited to return in the future as part of a continuation plan of this extension of services?

2. How many days should the mobile clinic be offered in the future?

3. Approximately how many vaccines per day should the pharmacy plan on bringing in order to meet the demand on campus?

4. Are there any changes or planning needs for the future if this occurs again?

The pilot partnership was important to explore as an option for overcoming billing obstacles for students in regard to influenza vaccines. While this partnership was only one part of the program, it was the latest addition to the program and offered opportunities for growth and expansion from past offerings. This concluded the quantitative analysis for the project.

Additionally, I gained qualitative data through nonstructured, open discussion interviews with the current program director to grasp a fuller understanding of the program. During initial conversations with the director about the project, she reported the clinic had tried having flu shot clinics in various settings on campus in the past but with the current billing structure of having the students pay out of pocket. Additionally, the director stated in early discussions that the basketball teams sometimes came together to get flu shots as a group and their department was billed for it rather than requiring students to pay out of pocket. I explored this issue as part of the comprehensive program review to determine if other sports teams would be interested in
providing similar benefits by offering an official team time to visit the clinic for flu vaccines and for the vaccines to be charged to the team budget. Advantages of interviews with key informants in data collection included gaining depth of information, developing a relationship with the client, and clarification of details (CDC, 2012). Qualitative analysis provided important information regarding themes or patterns that could be useful for understanding a specific phenomenon (Moran, 2017).

In summary, I collected and analyzed quantitative and qualitative data to gain a comprehensive understanding of the immunization program on campus. Components of this program analysis included the following:

1. collecting data to obtain the percentage of uptake of influenza flu vaccine on campus from 2012 through 2018,
2. interviewing the clinic director to gain understanding of all aspects of the immunization program, and
3. making recommendations on improving services related to influenza vaccination through the health clinic, including if the pharmacy should return in future years to continue the partnership and offer billing services for students.

Recommendations given should be in line with the constructs of the TPB and the conceptual framework of PNPDF to align with the foundations of the scholarly project.

**Methodology Appropriateness**

A program evaluation does not include direct subject participation of the patients for research, rather it evaluates clinical practices currently in place. The nonexperimental research design for this project was thus appropriate. I gathered information from past records, interviews with the program director, and from the pharmacy provider to analyze a complete picture of the
influenza vaccination program and extension. I obtained a letter of support from the university’s health center program director prior to the start of the project, stating her willingness to cooperate with the requests for information and participate in the evaluation (see Appendix E).

The Six Sigma process is recognized as a structured, logical tool that works for small to large companies and provides a “journey for improvement” (Rastogi, n.d., para. 31). Thus, this methodology was appropriate for the project. This approach guided the project and the feedback through a systematic methodology. Additionally, utility, feasibility, propriety, and accuracy are important aspects of a program review (CDC, 2012). Utility addresses who needs the evaluation results (CDC, 2012). For this program review, I provided the program director and dean of students a copy the final project. Feasibility asks if the planned evaluation activities are realistic given the time, resources, and expertise at hand (CDC, 2012). This project was feasible given that a doctoral nursing student with a background in public health and community education performed the evaluation collaboratively with the program director over a 9- to 12-month time span. Propriety asks if the evaluation will protect the rights of the individuals involved (CDC, 2012). The security of the data collected was maintained, and no names or identification markers were documented, thus protecting the identity of students. All flu vaccinations were optional, and there was no coercion. Lastly, I maintained accuracy by providing valid and reliable data (CDC, 2012). This framework provided a methodologically sound approach to the project.

**Institutional Review Board Approval and Process**

I completed the required ethics and core training needed for IRB approval, including the National Institute of Health (NIH) Protecting Human Research Participants course. The health clinic where the program analysis occurred was located on the campus of a local private college. I submitted the IRB request to that university after the required project proposal and university
where I am a student approved the first three chapters of this document. I submitted the project description, abstract, protocol, benefits and risks, confidentiality of data, and information on participants. I included a copy of the health clinic’s policy and procedure for injections (see Appendix A) because this project required an injection form of a vaccine. The IRB committee replied that an exemption review was needed and granted final approval to move forward with the project (see Appendix F).

**Interprofessional Collaboration**

Interprofessional collaboration is important in many projects. The partnership with the local pharmacy to bring in a mobile flu clinic required collaboration with a pharmacist. The clinic director of the health clinic was a nurse practitioner providing direct patient care. The researcher is an assistant professor of nursing at a university that specializes in community health. Collaboration and communication between all involved parties was crucial to gain needed information. The pharmacist who supervised the mobile clinic was chosen by the director because the pharmacist is married to a staff member at the university. The clinic director felt that the pharmacist may have enhanced motivation to help as her family was already invested in the local community and university. Relationships and interpersonal dynamics are important for team collaboration.

It was very helpful to work as a team and collaborate. The clinic director was busy with the immediate practice on campus and had other responsibilities outside of the influenza immunization subcomponent of the university health clinic. The director validated that she would not have the time to complete a thorough program evaluation and complete detailed research on this topic. By working in partnership on this scholarly project, she obtained information from me but did not have to put in all the work and time herself. The health clinic on
campus was not able to bill private student insurance. By partnering with a local pharmacy that offered billing as a benefit to students, the clinic benefitted the overall campus by increasing the number of students vaccinated against influenza and thereby decreasing the chances of spreading infectious disease. Having interprofessional collaboration on this project provided benefits for the health clinic and for the student body.

**Practice Setting**

The practice setting was a faith-based, private university health clinic on a campus located in a suburban city of a western state. The health clinic was located on the second floor of the student center in a main area of campus. The pharmacy’s mobile clinic location was set up on the first floor of the main student center. The location chosen for the mobile clinic was in the area where students pass through to go to the cafeteria. This location was chosen to offer the utmost convenience to students and to be within eyesight during lunch hours.

**Target Population**

The target population was undergraduate students attending a private faith-based university. The demographics of the sample population from 2016 to 2017 included a student body of 1,343 students from all 50 states and several foreign countries. Only 18% of students were considered ethnically diverse, and there was a 1:2 male to female ratio. Approximately 68% of the student body for that year lived on campus, and there were 240 student athletes participating in NCAA Division II activities. The population at this university may not represent as ethnically diverse a group of college students as some universities do, but they do represent students coming from a wide variety of home states and countries.
Risks/Benefits

While there were inherent risks associated with administering vaccines, the clinic already administered immunizations on a regular basis, and therefore there was no additional risk for the health clinic. The pharmacy that provided the mobile flu shot clinic asked students to sign a release before administering the vaccine. Protocols for administration of immunizations were in place through both the health clinic and the pharmacy. The director approved and coordinated the pharmacy extension. There was potential that the program director could take offense to some of my recommendations or advice. However, it was important to maintain a professional and evidenced-based approach and not imply that the vaccination program was subpar or that the low rates of vaccination were the fault of the clinic administration or staff. It was also important to document the successes and what the program was doing well in order to provide a well-rounded report.

The feedback from the evaluation could be of great benefit to the program director at the health clinic. Often administrators and practitioners are overtasked with responsibilities and do not have the time to do the extensive research and data analysis. The information collected provided a service for the university by summarizing the findings and providing practical recommendations for the program to use for growth. The health clinic director was free to determine the value of the recommendations and choose whether to implement them or not.

Timeline

The project started in August 2017 by identifying a problem of concern. A preliminary discussion took place with the director of the health clinic at the project site to obtain support in the summer of 2018. IRB approval was finalized in November of 2018. The total project time
frame was from August 2017 through November 2019. Table 1 shows an outline of the project timeline. A graph of the project task list is included in Appendix B.

Table 1

**DNP Project Timeline**

<table>
<thead>
<tr>
<th>Completion Date</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 2017</td>
<td>Identified problem of interest for project</td>
</tr>
<tr>
<td>September 2017</td>
<td>Developed PICOT question for capstone project</td>
</tr>
<tr>
<td>February 2018</td>
<td>Completed literature review</td>
</tr>
<tr>
<td>August 2018</td>
<td>Completed ethics core training and NIH protecting human participants course</td>
</tr>
<tr>
<td>August–October 2018</td>
<td>Wrote Chapters 1–3 and met with DNP committee for guidance and approval</td>
</tr>
<tr>
<td>September–October 2018</td>
<td>Met with health clinic director to discuss project and help organize the pharmacy mobile clinic on volunteer basis</td>
</tr>
<tr>
<td>November 2018</td>
<td>Defended project proposal with DNP committee (approved)</td>
</tr>
<tr>
<td>December 2018</td>
<td>Submitted for IRB approval</td>
</tr>
<tr>
<td>January–March 2019</td>
<td>Received final IRB approval</td>
</tr>
<tr>
<td>March–May 2019</td>
<td>Collected data from previous flu seasons, 2012–2017</td>
</tr>
<tr>
<td>March–May 2019</td>
<td>Collected data from 2018–2019 flu season</td>
</tr>
<tr>
<td>March–May 2019</td>
<td>Analyzed data and created poster project that outlined the results</td>
</tr>
<tr>
<td>May–June 2019</td>
<td>Presented poster project at a professional nursing conference</td>
</tr>
<tr>
<td>May–August 2019</td>
<td>Worked on Chapters 4–5 of project paper, submitted to DNP committee for feedback, and made changes and updates per all recommendations.</td>
</tr>
<tr>
<td>August 2019</td>
<td>Submitted DNP paper</td>
</tr>
<tr>
<td>August–September 2019</td>
<td>Finalized paper based on continued feedback and guidance of the DNP committee and writing lab</td>
</tr>
<tr>
<td>September 2019</td>
<td>Presented DNP final defense (approved)</td>
</tr>
</tbody>
</table>

**Summary**

Through this program evaluation, I assessed the influenza vaccine component of the university health clinic’s immunization program. I generated data from 2012 to 2018 regarding how many students obtained a flu shot on campus. I did not use the data collected to provide
overall flu vaccination rates of the population at hand but to look exclusively at the number of influenza vaccines given on campus and compare them to determine growth or stagnation. I calculated the percentage of students who partook of the health clinic’s offering of influenza vaccines. The impact of the partnership with the local pharmacy and offering of the mobile flu shot clinic were analyzed. Recommendations were made based on the evidence in the current literature using the principles of the TPB and the DMAIC road map of the Six Sigma methodology for suggestions to potentially improve program outcomes.
Chapter 4: Results

This project was a program review for a U.S. university health clinic’s influenza immunization program. The health clinic struggled with low uptake of influenza immunizations on campus from 2012 through 2017. (Data from before 2012 were unavailable.) A pilot program extension with the local branch of a national pharmacy occurred in 2018, allowing the pharmacy to offer an on-campus mobile flu shot clinic for students. The main advantage of this option for students was that the pharmacy billed their insurance directly. The outcomes of the partnership are discussed in this chapter.

Purpose of the Project

The purpose of this project was to analyze the impact of offering a mobile pharmacy health clinic on campus and evaluate if this collaboration should be recommended in the future. I gave the summarized data and recommendations to key stakeholders. This program review helped assess the continued value of a mobile flu shot clinic that offered billing as an option. Through this project, I also analyzed challenges associated with the pharmacy expansion such as cost issues and unexpected obstacles that arose during the first-year pilot. Overall, this analysis helped to determine the feasibility of continuing the partnership and the planning necessary to overcome obstacles.

Despite the convenience that the mobile pharmacy clinic offered to students, some still made autonomous decisions not to get vaccinated. There are many reasons students might choose not to obtain a vaccine, even with the free options available with their insurance. For example, in a study by Bednarczyk et al. (2015), college students cited reasons for not obtaining a vaccine including apathy (“I don’t care enough”), fear (“I don’t like needles”), and lack of confidence in the vaccine (“the risks outweigh the benefit”; p. 1661). Feelings that prevent students from
obtaining the flu vaccine could be considered obstacles for health clinics on campus to overcome. These obstacles were addressed, and recommendations were made as part of the 

*improve* component of the Six Sigma DMAIC roadmap.

**Demographic Data**

As Table 2 illustrates, the undergraduate population at the university of study ranged from 1,041 to 1,398 students enrolled between 2012 and 2018. During the year when the program analysis took place (2018–2019), students from all U.S. states attended the university. Additionally, there were undergraduate students from 16 countries. Table 3 gives details on the demographics of students enrolled during the 2018–2019 school year.

Table 2

*Demographic Data: Undergraduate Enrollment, 2012–2018*

<table>
<thead>
<tr>
<th>Year</th>
<th>Undergraduate enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>1,041</td>
</tr>
<tr>
<td>2013</td>
<td>1,110</td>
</tr>
<tr>
<td>2014</td>
<td>1,180</td>
</tr>
<tr>
<td>2015</td>
<td>1,218</td>
</tr>
<tr>
<td>2016</td>
<td>1,320</td>
</tr>
<tr>
<td>2017</td>
<td>1,343</td>
</tr>
<tr>
<td>2018</td>
<td>1,393</td>
</tr>
</tbody>
</table>
Table 3

Demographic Data: Student Demographics

<table>
<thead>
<tr>
<th>Detail</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time residence out of state</td>
<td>54%</td>
</tr>
<tr>
<td>Lives on campus</td>
<td>64%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>70%</td>
</tr>
<tr>
<td>Male</td>
<td>30%</td>
</tr>
</tbody>
</table>

Using Six Sigma for Program Review and Intellectus Software for Data Analysis

Due to the nature of this project being a program review, I chose the Six Sigma process to provide structure for this paper. The methodology of this process includes the categories define, measure, analyze, improve, and control (DMAIC; International Six Sigma Institute, n.d.). A modified and condensed version of Six Sigma was used, and statistical formations were collected using Intellectus (2019).

Figure 2. An illustration of the Sigma Six DMAIC road map.

Define phase. The define phase of the Sigma Six DMAIC process involves capturing the voice of the client to identify and understand the issues at hand within the business and define the project as follows:

- Step 1: Validate a business opportunity and identify a project that is critical to quality (International Six Sigma Institute, n.d.). A meeting with the health clinic director revealed that she was willing to work with me as the researcher and that the university had had historically low influenza vaccine uptake on campus since 2012.
• Step 2: Conduct project storyboarding and team charting (International Six Sigma Institute, n.d.). During this and other subsequent meetings, the director stated she had made attempts to increase the number of flu vaccines given out on campus, but challenges persisted.

A possible problem was that students had a $20 out-of-pocket expense for the flu vaccine and were not willing to spend their own funds on the vaccine. The director stated that she had considered asking a pharmacy that could bill insurance to come on campus for a day or two to offer a mobile clinic. This doctoral project began when the director considered this option and asked me to voluntarily undertake some of the administrative work for this project.

I established the following PICOT research question to provide an area of focus within the program review and to evaluate the program extension: On a private university campus, how does collaboration with a pharmacy for a flu vaccination clinic affect the number of undergraduate students who obtain a flu vaccination on campus within the time frame of the flu season (September through February) compared to the usual practice of only offering flu vaccination in the health clinic as an out-of-pocket expense?

**Measure phase.** Measuring includes collecting relevant data by quantitative and qualitative means (International Six Sigma Institute, n.d.). Interviews with the health clinic director provided qualitative data and examining records of vaccines given and ordered during the years 2012-2017 provided historical quantitative data.

**Analyze phase.** In this phase, potential causes are identified and validated (International Six Sigma Institute, n.d.). There were many possible reasons why students were not obtaining a flu vaccine on campus. Although the health clinic offered flu vaccinations for students every year, relatively few would go to the clinic to get a flu shot. The qualitative feedback from the
director was that students did not seem interested in getting a flu shot and would pass by the clinic in a hurry. The director stated that the cost of the vaccine, even though it was reasonable at $20 per injection, may have driven away young undergraduate students who did not want to use their own funds to pay for an immunization. Additionally, general student apathy was noted in regard to health and primary prevention.

**Improve phase.** Steps in this phase include developing a pilot to validate a selected solution (International Six Sigma Institute, n.d.). One way to determine if billing is a barrier for students is to offer an alternative to paying out of pocket and then compare the number of students who elect to get a flu shot. Thus, I asked a pharmacy to bring in a mobile flu shot clinic and bill students’ insurance during a pilot conducted in the fall of 2018.

**Control phase.** The Control phase involves post-implementation monitoring to ensure that the expected improvement has occurred (International Six Sigma Institute, n.d.). The following data were collected following the implementation of the pilot. Intellectus (2019) was used to analyze data and to create several of the tables and charts detailed in this paper. Table 4 provides an overview of the data collected.
Table 4

*On-Campus Flu Shot Uptake*

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Flu shots given on campus</th>
<th>Undergraduate enrollment</th>
<th>% of students who obtained a flu shot on campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012–2013</td>
<td>25</td>
<td>1,041</td>
<td>2.40%</td>
</tr>
<tr>
<td>2013–2014</td>
<td>50</td>
<td>1,110</td>
<td>4.50%</td>
</tr>
<tr>
<td>2014–2015</td>
<td>70</td>
<td>1,180</td>
<td>5.93%</td>
</tr>
<tr>
<td>2015–2016</td>
<td>34</td>
<td>1,218</td>
<td>2.79%</td>
</tr>
<tr>
<td>2016–2017</td>
<td>70</td>
<td>1,320</td>
<td>5.30%</td>
</tr>
<tr>
<td>2017–2018</td>
<td>49</td>
<td>1,343</td>
<td>3.64%</td>
</tr>
<tr>
<td>2018–2019</td>
<td>132</td>
<td>1,393</td>
<td>9.46%</td>
</tr>
</tbody>
</table>

The 2018–2019 flu season was the only one in which the pharmacy mobile clinic was in operation. That year, 61 flu shots were given in the university health center following the usual procedure and 71 were given by the local pharmacy in a 1-day mobile flu shot clinic. Within the 5 hours the clinic was open, the mobile clinic workers gave more flu shots than the health clinic did for the entire season. The mobile flu shot clinic immunized 5.08% of the student population in a one-day, five-hour clinic.

The last phase of the Sigma Six process is to finalize documentation and communicate results to the key stakeholders. Chapter 5 contains recommendations for the university based on the findings of this study. The study concluded with a handoff of information to all decision-making authorities for continued collaboration with the pharmacy at the discretion of the director.
Additional Descriptive Statistics

Figure 3 illustrates the impact of the program extension pilot on the overall percentage increase of influenza vaccines taken on campus. The graph shows a dramatic increase in 2018 compared to all previous years. The average proportion of undergraduate students who received a flu vaccine between 2012 and 2017 was 4.09%. After opening a mobile pharmacy clinic for only one day, the percentage of students who obtained a flu vaccine rose to 9.46%, a 131% increase over the historical average.

Figure 3. A bar graph of the percentage of students vaccinated on campus by year. The years 2012-2017 were prior to the project. The year 2018 was the flu season when the project partnership with the pharmacy occurred.
**Proportion Analysis**

I completed a two-proportion $z$ test to examine whether there was a significant difference between the average uptake of flu vaccine given on campus during the years 2012–2017 and the uptake of flu vaccine on campus with the pharmacy extension in 2018. The assumption of normality was assessed for the variables of interest. According to the central limit theorem (CLT), the mean of any random variable is approximately normally distributed as sample size increases. Therefore, with a sufficiently large sample size ($n > 50$), deviations from normality have little effect on the results (Stevens, 2009). The sample size ($n_{s1} = 1202, n_{s2} = 1393$) indicated the CLT applied and that normality could be assumed for the $z$ test.

The results of the two-proportion $z$ test were significant based on an alpha value of 0.05, $z = -5.43, p < .001, \text{CI} = [-0.07, -0.03]$, indicating that the null hypothesis could be rejected. This suggested the proportion of the average uptake of flu vaccine given on campus during the years 2012–2017, when only a health clinic option was available, was significantly lower than the proportion of uptake of flu vaccine on campus with the pharmacy extension in 2018. The confidence interval ($\alpha = 0.05$) for the difference between the proportion of the average uptake of flu vaccine during the years 2012–2017 and that of 2018 with the pharmacy extension was −0.07 to −0.03. Table 5 presents the results of the two-proportion $z$ test.
Table 5

Results of the Two-Proportion z Test

<table>
<thead>
<tr>
<th>Samples</th>
<th>Responses</th>
<th>n</th>
<th>Proportion</th>
<th>SD</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average uptake of flu vaccine given on campus, 2012–2017</td>
<td>50</td>
<td>1,202</td>
<td>0.04</td>
<td>0.20</td>
<td>0.01</td>
</tr>
<tr>
<td>Uptake of flu vaccine on campus with the pharmacy extension, 2018</td>
<td>132</td>
<td>1,393</td>
<td>0.10</td>
<td>0.29</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Note. $z = -5.43$, $p < .001$, CI for $\alpha = 0.05$: $[-0.07, -0.03]$.

Challenges

One issue that came up after the mobile pharmacy clinic was that students’ insurance providers rejected 11 of the 71 flu vaccine payments requested. The pharmacy charged $41 per injection; thus, the funding gap was $451. The pharmacy agreed to write off the expenses for the pilot but could not guarantee it would do so for future clinics. This is a significant and important challenge for the mobile pharmacy clinic in that students could possibly end up with an out-of-pocket bill that would have been even higher than the cost of receiving the vaccine from the campus health center. If the mobile clinic plans to advertise that the flu vaccine is free with health insurance, then it would be unethical for students to end up with the bill. Although the pharmacy required students to sign a waiver stating that if their insurance did not cover the vaccine, they would be personally responsible for payment, most did not take the time to read the details of the form. Additionally, if the pharmacy had not written off the uncovered immunizations, students might be less trusting of future events or even angry about receiving a bill. For these reasons, planning with the pharmacy must occur to ensure students will not end up with an unexpected out-of-pocket charge.
Strengths and Weaknesses of the Project

This project provided valuable information to the health clinic. The strengths of this program evaluation included the completion of a detailed analysis of all data related to flu vaccinations given through the health clinic from 2012 through February 2019. Additionally, the program included discussion and planning with the clinic director as the key stakeholder for the health clinic and interdisciplinary collaboration with a pharmacist to overcome the limitation of billing students’ insurance. Another strength of this study was the examination of other factors for creative ways to improve the number of flu vaccines given on campus, such as extending partnerships with sports teams.

Lastly, for this study, I used the theory of planned behavior (TBP), which is a highly researched framework that helps explain the underlying intentions and motivations from research on the population of college-age students. Limitations of this study included not being able to identify the total percentage of undergraduate students who obtained a flu vaccine for the year. It was expected that some students obtained a flu vaccine off campus. This information would have provided a more holistic view of the immunization rates on campus, but it would have been challenging to obtain accurate figures. Doing so would have required additional student surveys; therefore, these data were not collected as part of the program evaluation.

Recommendations for Future Research and Implications for Nursing Practice

Additional research on collaborations with outside agencies such as pharmacies would provide supportive data and validate if this intervention could be effective at other universities. Further interdisciplinary research is recommended to explore options for students on college campuses. The research for this project demonstrated that for one university there was a significant improvement in the uptake of influenza immunization with the addition of a mobile
flu shot clinic offered by a pharmacy. Other university clinics could use this research to support the idea of collaborating with local pharmacies to provide mobile clinics for students. Mobile pharmacy clinics add convenience and financial options for students.

**Conclusion**

Addressing these factors increased the percentage of students who opted to receive a flu shot on campus, potentially maintaining the health of college students on campus. This process of partnering with a pharmacy to provide billing and offer additional options for students could be duplicated across other universities to improve the health of college students. Expanding options for college students to obtain flu vaccines without any out-of-pocket expense could improve public health and help achieve the goal set out by the Healthy Campus Initiative of the American College Health Association (ACHA) of having 43.9% of students vaccinated on campus (2018).
Chapter 5: Discussions, Recommendations, and Conclusions

In this chapter, I synthesize the overall findings from this project and propose specific steps and actions to increase the uptake of influenza vaccination on campus. I compare the percentage of students on campus who received flu vaccinations to the recommendations made in the Healthy Campus 2020 initiatives, outline recommendations for the continuation of the pharmacy mobile flu shot clinic option, and discuss the importance of having a plan in place to explain how the pharmacy will handle denied claims. Further, I make recommendations for marketing mobile flu shot clinics using the principles from the TBP. The TBP suggests that educational programs such as a question-and-answer symposium could play a role in helping young adults determine their personal values and thoughts regarding primary prevention and vaccination. Lastly, I examine other methods of extension of the program outside of the pharmacy mobile clinic, such as recruiting athletic departments to cover the cost of influenza vaccines for their teams. In the conclusion, I discuss the impact of influenza on campus and demonstrate the value and benefit of actions taken to increase vaccination.

Interpretation of Findings

The results from this DNP project showed that an average of 4.09% of the undergraduate students at the project site obtained a flu shot on campus in the years 2012–2017. This differed from previous studies that showed that “between 8–39% of college students get vaccinated each year for the flu” (Kuzman, 2017, para. 5). One limitation of this study was that information was not gathered to determine how many students obtained an influenza vaccination off campus. Therefore, it was difficult to accurately know if the students on campus were falling within the normal range. Research showed that college students often do not obtain influenza vaccine in general and that only a small number of students go off campus to get their flu vaccination each
year (Svokos, 2014). The college campus studied for this project is likely similar to other U.S. college campuses whose students have low influenza vaccination rates.

As a result of the ubiquitously low immunization rates of college students across the United States, the ACHA (2018) set a Healthy Campus 2020 objective to “increase the proportion of students who report receiving influenza vaccine in the last 12 months” (para. 8), with a target of achieving 43.9%. Certainly, there was a large gap between the target goal (43.9%) for college campuses and the actual percentage (4.09%) of students who were immunized on campus in previous years.

This project demonstrated that collaboration with a pharmacy for a flu vaccination clinic affected the number of students who obtained a flu vaccination on campus. There was a significant increase in the proportion of students receiving a flu vaccine on campus for the year 2018 when the mobile flu shot clinic was offered compared to the average of the years prior (2012–2017) when the health clinic was the only option for students to obtain a flu vaccine and it would cost them $20 out of pocket.

**Inferences About the Findings**

The number of flu vaccinations at the project site increased during the project. The percentage of flu shots given to the student body on campus during the 2018–2019 flu season (9.46%) increased significantly (131%) compared to the average for 2012–2017 (4.09%), demonstrating the positive impact of the pharmacy expansion pilot. The pharmacy vaccinated 71 students who may have otherwise not been vaccinated. This potentially improved the health of students on campus and served as a benefit to public health to increase immunization rates of this aggregate group in society.
It is in the best interest of the university for students to be vaccinated against the flu. When unvaccinated students get the flu, it can cost them multiple days missed at school and at work creating a burden for students to catch up on schoolwork or potentially reducing the money they have to pay for schooling. Because students in colleges are in tight living quarters and are often in shared spaces, they are more likely to spread the flu quickly. In addition, public health officials, university administrators, and parents of college students do not want the flu to impact the aggregate community of a university. The flu adversely affects many stakeholders:

- Students do not want to get the flu.
- Parents do not want their children to be sick while they are away at college and there is no one to take care of them.
- Faculty do not want to deal with student absences because of illness or spend extra time coordinating makeup work or alternate exams.
- Sports teams do not want their players missing competitions and key events due to the flu.
- University administrators want what is best for their students and the community, which is to keep students healthy and well throughout the school year.

Implications for Analysis for Leaders

All community leaders desire health for college students; however, the findings of this project may be of particular interest to directors of university health clinics, who may find the results of this program analysis helpful to validate similar programs on their campuses. Public health officials work to improve the health of the community by increasing vaccination against the flu for all people. Epidemiological studies indicate that college students are at higher risk of contracting influenza. ACHA (2018) leaders have set goals for increasing the proportion of
students who receive the flu vaccine each year. University administrators have a responsibility to help their students stay healthy and provide wise counsel to the young adults who attend their institution. Public health leaders can work with university health clinic directors and administrators to educate students on the benefits of vaccination. Additionally, collaboration with local pharmacists and interprofessional leaders in the community may provide increased options for students to improve the uptake of flu vaccine on campuses across the nation.

**EBP Findings and Relationship to DNP Essentials**

This project’s findings supported the DNP Essentials for Advanced Practice Nurses outlined by the American Association of Colleges of Nursing (AACN). The DNP essentials were created by a task force to guide practice-oriented doctoral education by outlining “the curricular elements and competencies that must be present in programs conferring the Doctor of Nursing Practice degree” and discussing “foundational competencies that are core to all advance practice roles” (AACN, 2006, p. 7).

**Essential 1: Scientific underpinnings.** The data collected provided scientific underpinnings for nursing practice, supporting the AACN’s DNP Essential 1 and providing clinical scholarship and analytic support for an evidence-based intervention linked to DNP Essential 3 (AACN, 2016). The results of the pilot program demonstrated that providing a pharmacy-based mobile clinic on a college campus that could bill student insurance was effective in improving the percentage of uptake of influenza vaccine on a college campus. This provided support for the intervention as an evidence-based intervention.

**Essential 2: Organizational and systems leadership for quality improvement.** This program review addressed how an organization, in this instance, a university, could improve the quality of the vaccination program it offers students. During a pilot extension of the program, a
pharmacy partnership in the form of a mobile clinic was used to expand the traditional program offerings. This outreach created multiple billing options for students, including the option to bill insurance. When organizations creatively overcome obstacles and offer solutions to issues that hinder the health of students, then the public wins.

**Essential 3: Clinical scholarship and analytical methods for evidence-based practice.** The program review and data from the pilot program provided a base of information that researchers can use to explore offering mobile flu shot clinics on college campuses. I based the analytic method used for the program review on the DMAIC portion of the Six Sigma process. The data collected demonstrated the impact of the pharmacy mobile clinic option on campus.

**Essential 4: Information systems and patient care technology for the improvement and transformation of health care.** In a world of technical advances that improve the information exchange of health resources, universities must rise to meet new challenges. Universities should not accept that the only option for students on campus is to pay out of pocket. Instead, universities should find options to overcome billing challenges. The health clinic in this study was in traditional out-of-pocket mode for the six years before the pilot. During the pilot, a pharmacy used the technology available to bill students’ private health insurance and overcome the barrier of out-of-pocket expenses.

**Essential 5: Health care policy for advocacy in health care.** Directors of university health clinics have a voice in public health which emphasizes the importance of nurses—in this case, the clinic director—attending local, regional, and national meeting and conferences to learn about policies and laws that could impact vaccination regulations or resources. The clinic director can have a voice in policy that encourages increased regulation and required
immunizations. Additionally, the clinic director could learn about policies that would offer resources to low-income adults or college students and then support such legislation.

**Essential 6: Interprofessional collaboration for improving patient and population health outcomes.** Partnering with a pharmacy is a means of interprofessional collaboration to improve patient and population health outcomes, supporting DNP Essential 6 (AACN, 2016). It is important for nurses to use resources available within the health care industry. By partnering with a local pharmacy, the university health clinic put students’ needs first. This also allowed the pharmacists to serve the local population by providing more influenza vaccinations to college students who travel throughout the community and could pass the flu to residents. Thus, increasing influenza vaccination rates on college campuses improves the health of the overall population.

**Essential 7: Clinical prevention and population health for improving the nation’s health.** The outcomes from this study should be tested internationally at other campuses that do not have the means to bill student insurance. This could have implications for national health, thus addressing DNP Essential 7. Additional research is needed to validate this as an evidence-based approach to improve vaccination rates on college campuses. This project provides a basis for such research.

**Essential 8: Advancing nursing practice.** Overall, the CDC supports the ability of program evaluations to provide evidence to advance nursing practice (DNP Essential 8). Publishing this project will provide data and options for other colleges to employ to increase their own influenza vaccination rates on campus, thus advancing nursing practice through collaboration and evidence.
**Recommendations**

Specific recommendations are made in this section for future actions to improve influenza vaccination on campus. Program-specific recommendations include the following:

1. Continue the pharmacy partnership and mobile flu shot clinic in future years.
2. Have a written plan that outlines how any denied claims will be handled, ensuring that students will not receive a bill if their insurance denies coverage of the vaccine.
3. Expand the mobile clinic to a 2-day event.
4. Market the mobile flu shot clinic using specific recommendations from the TBP.
5. Offer educational options such as a question-and-answer symposium on vaccines to help students formulate their own ideas and values related to vaccination as primary prevention.
6. Reach out to other sporting teams to expand partnerships with athletic departments to possibly cover the cost of the influenza vaccination through the health clinic and bring interested students in as a team.
7. Attend local, regional, and national conferences to gain knowledge on policies that impact the immunizations of college students, advocating for policies that support vaccination (especially influenza vaccination and resources).

A combination of these actions would likely increase the uptake of influenza vaccine on campus.

**Continue the pharmacy partnership and the mobile clinic.** The pharmacy partnership was put into place as a pilot in 2018 to examine the impact of adding a mobile clinic that billed insurance for students to avoid out-of-pocket expenses. The impact was significant with a 131% increase in the total flu vaccines given on campus in 2018 compared to the average over the previous six years. The mobile flu shot clinic immunized 5.08% of the student population in a
one-day, five-hour clinic. This successful intervention helped overcome the barrier of out-of-pocket vaccination costs for students. Additionally, the student response was positive. For example, students were overheard saying that the mobile clinic provided quick service, and some thanked the pharmacist for providing this convenient service.

The mobile flu shot clinic required several hours to coordinate, schedule, and set up; however, this was a collaborative effort and did not pose a significant time burden on any one person. This was shown through the positive feedback from all parties involved in the organization and planning of the overall experience, with many stating that it was a manageable task to coordinate and carry out. The system the university had in place allowed for a work order from the clinic director outlining what she needed and where it should be set up. A crew from the university then set up the area. There were plenty of tables and chairs, areas for privacy, and other resources. The pharmacy brought in a supply of vaccine in coolers to maintain the required temperature. The clinic was limited to a 5-hour window to maintain the level of cold required for the vaccines. The mobile flu shot clinic may be carried out again in future years but will require a lead person to facilitate and a team to collaborate.

**Planning is needed to detail how denied claims will be handled.** Despite the success of the mobile health clinic, some challenges must be addressed if the mobile clinic is offered in the future. As previously mentioned, 11 of the 71 vaccinations billed by the mobile clinic were denied by insurance, with one vaccination denied because the student had Kaiser Permanente insurance. Although the pharmacist knew that anyone with this insurance must go to an approved facility, the claim slipped through due to human error. The other 10 claims were denied for various reasons by insurance companies. Students’ insurance was not run in advance of giving the immunizations because the pharmacist said that doing so would have slowed down the
process significantly and it would not have been realistic to coordinate between the pharmacy’s permanent and mobile locations. Therefore, the pharmacist collected insurance information by making copies of the insurance cards and then processed the claims on site at the pharmacy at a later time.

If this partnership continues in the future, it is recommended that an arrangement be made to determine how the pharmacy will deal with any declined charges without passing them on to students. It is important that students do not receive a surprise bill after expecting the vaccine to be covered, especially since the pharmacy charged $41 per dose because it was using the more expensive premade single-dose syringes. Comparatively, the on-campus health clinic used multidose vials and only charged $20 for a flu vaccination. If students receive a bill for more than double what the out-of-pocket expense would be on campus, this would not provide a benefit to students.

In order for the pharmacy mobile health clinic to continue in the future, a plan should be made between the director of the health clinic and the pharmacy to determine how denied claims will be handled. For the pilot, the pharmacy agreed to write off the denied claims; therefore, it is recommended that whoever manages the flu shot clinic in the future should obtain a written statement from the pharmacy regarding its willingness to cover denied claims. If the pharmacy is not willing to cover such claims, then the administration could be contacted to determine its willingness to offer contingency funds to cover such a gap. Another option is for the university health clinic to seek a grant that would cover this expense. Some grants that are options for public universities are not available to private faith-based schools such as the university where this research was conducted. Therefore, it is important to create a backup plan for how to handle denied claims.
Expansion and scheduling. Keeping in mind the collective benefits and challenges of the mobile clinic, I recommend the university continue the partnership with the pharmacy in future years or at least until an alternative on-site billing insurance billing option through the health clinic exists. The mobile clinic was offered for only five hours on one day. It is possible that some students wanted to attend the clinic to obtain a flu shot, but their schedule for the day would not allow it. Friday is not recommended for a flu shot clinic at this university because courses do not run on Fridays and many students leave campus for either leisure or work. Therefore, it is recommended that the pharmacy clinic be offered on two days of the week, once on a Monday or Wednesday and once on a Tuesday or Thursday.

Marketing future mobile clinics. Should the mobile flu shot clinic continue for future years, additional marketing is recommended to inform students of the event. During the 2018–2019 academic year, generic signs were posted to announce the event. Additionally, an announcement was posted in the parents’ Facebook group. Several students mentioned that their parents had seen the post and had called to encourage them to obtain their flu vaccine through the advertised flu shot clinic. These student reports correlated with the TBP, which stated that ideas expressed by close friends and family members can become subjective norms (Agarwal, 2014). Societal influence is a valid component to explore; thus, it is recommended that the announcements for the mobile flu shot clinics be posted in the parents’ Facebook group a week in advance and then the day before as a reminder. Additionally, a mass email should be sent out in early September detailing the options for obtaining the flu vaccine on campus. An example email is provided in Appendix C.

Additionally, a question-and-answer symposium could be offered for students prior to the event to educate them and answer any questions they have regarding the vaccine in advance.
This could be set up in the main student center as a booth where information is available and experts are there to answer questions about the vaccine and to debunk myths. The TBP supports the idea that if people decide or intend to perform an action in advance, they are more likely to carry through with the action (Agarwal, 2014).

Lastly, marketing of the mobile flu shot clinic across campus is important and should be completed in a meaningful way using TBP research and vaccine intentions. According to the TBP, signs such as “Don’t be the one to get your roommates sick—get the flu shot!” or “College students have to make adult decisions” emphasize the new societal pressure of being a responsible roommate and young adult. “Choose to get immunized against the flu!” can be effective in reinforcing societal pressures and respecting the students’ newfound ability to make independent choices (Agarwal, 2014). These are just a few examples of how the TBP can be an important way to phrase marketing messages on college campuses.

**Increasing partnerships with athletic departments.** The clinic director noted that each year a portion of the immunizations on campus are given to the men’s and women’s basketball teams. The basketball teams agreed to have the cost of the immunization billed to their department for students who chose to get vaccinated. All interested members of the team would then go together to the health clinic. There was no coercion. According to the TBP, this could create some societal pressure if a large enough number of students took the offer for the free vaccine. This practice may be most relevant to basketball teams because their season aligns with flu season and they are at greater risk of losing players to the flu.

One of the recommendations for increasing the uptake of influenza vaccine on campus is to reach out to all of the athletic coaches to ask if they are willing to cover the vaccine cost for their players with their budgets. During the 2016 flu season, 31 of the 70 flu vaccines (44.29%)
administered by the health clinic were given to basketball players. In 2017, 30 of the 60 flu vaccines (50%) were given to basketball players. Several other sports teams could take advantage of this option as well. An email to all sports coaches that details their options and lets them know that the basketball team has been doing this for years should be sent out in the spring or summer. An example email is provided in Appendix D. Adding partnerships with other teams and athletic departments could be an effective way to increase uptake of flu vaccine on campus.

Other athletics offered at the university include baseball, cross-country, golf, soccer, track-and-field, and volleyball. These six new partnerships could increase uptake dramatically among undergraduate student athletes.

**Recommendations for Future Research**

Many studies validated that college students are a challenging aggregate group of society to vaccinate, but few researchers offered solutions (Argarwal, 2014; Bednarczyk et al., 2015; Benjamin & Bahr, 2016). Additional research is needed to explore options that would increase the uptake of vaccine among this group. Researchers should make evidence-based suggestions for universities to help campuses achieve the goals set out in the Healthy Campus 2020 initiative. Future research on interdisciplinary options on campuses, such as pharmacy partnerships, would support this project and validate it as an evidenced-based approach.

**Conclusion**

In conclusion, increasing activities that promote flu vaccine uptake on college campuses aligns with the PNPDF conceptual framework by contributing to the overall health of society. Having fewer college students in the community who have the influenza virus and are contagious decreases the chances they will spread the flu to family members or the community. College students have historically been a challenging demographic to reach; many colleges have less than
40% of the student body immunized against the flu (Lawrence, 2014). Factors such as self-proclaimed laziness, beliefs about not needing a vaccine because of the general health of young adults, and cost barriers have been cited as top reasons that university students do not get vaccinated for the flu (Bednarczyk et al., 2015). It is important other future research address these issues, increase communication with college students utilizing the TBP, and overcome obstacles such as out-of-pocket costs.

The TBP has been used in previous research to demonstrate that college students have various beliefs and intentions in regard to vaccines and primary prevention (Agarwal, 2014). It explains behaviors that students have regarding vaccine hesitancy and how to overcome the lackadaisical attitude of many college students. Agarwal (2014) emphasized the importance of communication messaging with these students that highlights individual responsibility and the benefits of the influenza vaccine not only for themselves but also for their roommates, family members, and friends. This research affirms that marketing for future mobile clinics should be structured around the TBP principles to have the greatest impact on college students and maximize the uptake of influenza vaccine on campus.

The flu vaccine is the main way to minimize the impact of influenza virus on a college campus. Achieving herd immunity through vaccination is key to keeping the greatest number of students well. Colleges must continue to explore creative ways to improve vaccination rates of their students, offering convenient options and working around obstacles such as cost.

As outlined in this project, the director of the health clinic at the university piloted a partnership with a pharmacy during the 2018 flu season, offering a mobile clinic and billing students’ insurance in an attempt to increase herd immunity on campus. This program was successful and would be beneficial to the student body if continued in the future. However,
planning is necessary to overcome challenges such as denied claims and to ensure that students are not charged for out-of-pocket costs. Other partnerships, such as those through the athletic departments, should be expanded. Education through question-and-answer symposia on the flu vaccine and marketing materials that use the recommendations of the TBP may also help improve the uptake of flu vaccine on campus. These efforts must continue for the greater good of the university.
References

doi:10.1080/07448481.2014.917650


doi:10.1016/j.vaccine.2015.02.033

doi:10.1155/2016/4248071


Appendix A: University Injection Policy and Procedure Protocol

STUDENT HEALTH CENTER
Medical Clinic Manual
Medication and Vaccine Administration

POLICY
It is the policy of the Health Center guidelines for the correct and proper administration of medications.

RESPONSIBILITY
It is the responsibility of the provider to administer therapy. It is the responsibility of the provider to follow the facility's policies and procedures carefully and always verify the 5 “rights” of medication administration. The “rights” of medication administration include right patient, right drug, right dose, right route, and right time.

PROCEDURE
1. For any medication given parenteral or oral, follow outlined guidelines:
   1.1 Determine need for medication/vaccination.
   1.2 Read label of medication of vaccine to be given and check expiration date.
   1.3 Withdraw or pour out necessary medication or vaccine.
   1.4 Check label again.
   1.5 Identify client, verbalizing client’s name.
   1.6 Check with client for allergy history. Have client sign consent form if appropriate.
   1.7 Do not give medication without client chart.
   1.8 If medication is refused, document in client’s chart.
   1.9 Oral medication (P.O.)
      • Witness client taking medication.
      • Document in progress notes medication, dose, route, and time.
   1.10 Parental (ID, SQ, IM)
      • Wash hands and prepare medication by using alcohol sponge, wipe off top of vial or break ampule.
      • Withdraw desire amount of medication into syringe. Use appropriate size needs or use prescribed syringe available.
      • Check label and dose again.
      • Identify client by name, check allergy history.
      • Observe client for 15 minutes after SQ, IM injections for any adverse effects of medication. Call 911 immediately if any do occur.
      • Have EpiPen available for anaphylactic reactions.

2. Preparation of Non-Unit Dose:
   2.1 Preparation of medication requiring reconstitution
      • Read the medication directions carefully for proper diluents, amount of dilution, storage directions and length of drug stability after mixing.
      • Label vial properly but do not cover original label of the drug.
   2.2 Withdrawing medication from a vial:
• Cleanse rubber stopper of vial with alcohol sponge using circular motion and friction.
• Using proper syringe, pull back plunger to the mark corresponding to the amount of solution to be withdrawn.
• Remove protective needle cap and insert needle through center of rubber stopper of vial.
• Inject air into vial and withdraw correct volume of drug.

2.3 Withdrawing medication from ampule:
• Flick top part of ampule to bring entire contents of medication into body of ampule.
• Score neck of ampule with file unless colored band appears around this area.
• Snap off top of ampule, away from you, using a protective cover around scored portion of neck to prevent cutting fingers.
• Remove needle protector from syringe, insert needle into solution without touching outside of ampule and withdraw correct volume of solution into syringe.

3. Administration
3.1 Explain procedure to client and provide for privacy.
3.2 Select site to administer medication according to the type of medication, condition of client and condition of various sites.
3.3 Assess that needle size is appropriate for patient. Change needle if necessary.
3.4 Position client to obtain maximum exposure of injection site.
3.5 For Intramuscular Injections, these positions may be helpful:
  • Gluteus medius: patient abdomen with toes turned in.
  • Ventrogluteal site: position patient on side with legs slightly crossed.
  • Vastus lateralis: position patient on back of side with back or foot turned out.
  • Deltoid: position patient on back, sitting, or standing with arm relaxed at side.
3.6 For subcutaneous injections, the following areas may be used:
  • Upper outer portion of the arm.
  • Anterior surface of the thigh.
  • Abdomen.
3.7 Remove needle cap from syringe.
3.8 Don Gloves. Cleanse skin area with alcohol sponge using circular motion and friction.
3.9 For intramuscular injections:
  • Stretch skin over site of injection to flatten subcutaneous tissues and insure insertion of needle into muscle.
  • Draw back on plunger to determine that the needle has not entered a vein (if blood appears in syringe, with syringe, withdraw needle and prepare another dose of medication).
3.10 For subcutaneous injections:
  • Grasp the area surrounding the site of injection and hold in a cushion fashion.
• Inject the needle quickly at an angle of 45-90 degrees, depending on the amount, needle length and tissue turgor. Once the needle is in site, release the grasp on the tissue.

3.11 Inject contents of syringe at a moderate rate.
3.12 Once contents of syringe are injected, rapidly withdraw needle from tissue.
3.13 Apply pressure over site with cotton ball if needed, and/or Band-Aid if indicated.

4. Nursing considerations
4.1 For medications requiring special intramuscular or subcutaneous techniques refer to specific procedures (Z-track, insulin, heparin, allergy injections, etc.)
4.2 Check medication label and/or medication insert sheet carefully for proper dilution, storage directions and expiration date.
4.3 Use strict aseptic technique in drawing up and administering medications.
4.4 Fluid volume injected in one site should not exceed the following amounts for adult patients:

<table>
<thead>
<tr>
<th>Intramuscular:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deltoid – 2 cc</td>
</tr>
<tr>
<td>Gluteus medius – 2 ½ - 3 cc</td>
</tr>
<tr>
<td>Vastus lateralis – 2 cc</td>
</tr>
<tr>
<td>Ventrogluteal – 2 cc</td>
</tr>
<tr>
<td>Subcutaneous – 1 – 1 ½ cc</td>
</tr>
</tbody>
</table>

4.5 Proper size needle for injection.
• Needle gauge depends on the viscosity of the medication
• Needle length depends on whether the injection is for an intramuscular or subcutaneous site.
• Intramuscular needle length depends on the patient’s muscle size, fat layers and injection site.

4.6 The site of the injection must be carefully selected because of the danger of damaging a nerve with the needle or irritating tissues with the drug.
4.7 Rotation of sites lessens patient’s discomfort and increases absorption.
4.8 For intramuscular injections, expose the entire muscle area so that anatomical landmarks can be properly identified and an injection site can be safely selected.
4.9 Do not replace needle cap but dispose of sharps in Biohazard sharps container. In cases where needles must be recapped, such as when giving titrated medication for injection, the needle must be recapped by 1) using one-handed method of recapping or 2) the use of a mechanical device for recapping.

5. Documentation:
5.1 Chart medication given, time, injection site and initials
5.2 Chart vaccines on appropriate vaccine administration form.
5.3 Chart allergy injections in client progress notes & on an allergy injection record.
5.4 Chart client response or any untoward reactions in the progress note and/or on the appropriate form.
5.5 Chart client education in progress note.

Original: 11/98
Revised: 12/03
Reviewed 5/07, 5/12, 10/18
Appendix B: Project Task List

**Year 2017**

<table>
<thead>
<tr>
<th>Task</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identified problem of interest for project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Developed PICOT question for capstone project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**Year 2018**

<table>
<thead>
<tr>
<th>Task</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed literature review</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed ethics core training and NIH protecting human participants course</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Wrote chapters 1-3 and met with DNP committee for guidance and approval</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Met with health clinic director to discuss project and help organize the pharmacy mobile clinic on volunteer basis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Project proposal defense with DNP committee: Approved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Submitted for IRB approval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>IRB approval finalized</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Collected data from 2012-2017 flu seasons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
### Year 2019

<table>
<thead>
<tr>
<th>Task</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collected data from 2018-2019 flu season</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyzed data and created poster project that outlined the results</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presented poster project at a professional nursing conference</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Worked on chapters 4-5 of project paper.</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submitted to DNP committee for feedback, made changes and updates per all recommendations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalization of paper based on continued feedback and guidance of the DNP committee and writing lab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Submission of DNP Paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>DNP final defense presentation and approval</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C: Example Email for Marketing to Students

Dear Student,

Each year thousands of people are impacted by the flu costing millions of dollars to our society and even more importantly, lives lost. Young adults in college are especially at risk for contracting the flu due to being in close proximity with students in dorms, classroom, and even in the cafeteria. Students who obtain a flu vaccine are less likely to get a severe cause of the flu and often the duration of the symptoms are shortened. The Center for Disease Control and Prevention (CDC) recommends that everyone over age six months receive a flu vaccine each year.

Would you help us keep the campus safer by getting a flu shot this year? Even if you are relatively healthy, the virus it can be passed easily to roommates, other compromised individuals on campus, or to vulnerable populations in the community. In order to provide the most convenient and cost-effective means to our students we will be offering two options for you this year on campus to obtain your flu shot.

1. **The Health Clinic in the Student Center**
   The health clinic is open from 8 am to 5 pm daily and offers flu shots for the discount cost of $20 to students and staff. Stop by or make an appointment at your earliest convenience.

2. **Flu-Shot Clinics**
   A local pharmacy will be coming to our campus to set up a mobile clinic in the student center (right in front of the cafeteria) for 2 days only:
   - *September X, 2019 from 10:00-3:00*
   - *October X, 2019 from 9:00-2:00*
   They will be able to bill your private insurance. Most insurances cover the flu vaccine at 100%, making it free to students.
   *Students must bring their insurance card to the clinic.*

   Of course, students can also choose to receive their flu vaccine off campus at a local pharmacy or from their primary care provider. No matter where you get vaccinated, just make sure you do your part for the community and get vaccinated against the flu. We will be offering a vaccine symposium on campus on September X, 2019 from noon-2:00 in the student center. Stop by to pick up information on the influenza vaccine or to ask experts your questions on the vaccines and debunk myths from truths that you may have heard.

   Do your part to prevent illness on our campus and stop by to get a flu shot this season!

Signature Block
Appendix D: Example Email to Coaches

Dear Coach,

I want to let you know that an opportunity exists for you to partner with the health clinic on campus to keep your players healthy this year. The health clinic offers discounted flu shots for students and staff of the university. (The cost at the health center is $20, whereas the cost at our local Walgreen’s pharmacy is $41 without insurance.) Athletic departments can choose to have the vaccine billed to their department and bring their team together to obtain their vaccines at a time that is convenient for the group. The men and women’s basketball teams have been doing this for the past several years and we would like to offer this option to all of our sporting teams.

As you know, the flu can spread quickly and take out multiple players impacting the success of games and practices. The flu shot can decrease the severity and shorten the length of symptoms if a person is exposed to the virus. Help your team stay healthy and plan on taking advantage of this partnership with the health clinic on campus.

For any questions, please reach out to the clinic director. Thank you for helping to keep our campus healthy this year!

Signature Block
Appendix E: Letter of Support

[Redacted]

September 10, 2018

To Whom It May Concern:

This letter is written confirmation of my intended support for Kristi Hargrave, MSN, RN regarding the Doctor of Nursing Practice Project she will be doing at [Redacted]. I understand that this project is an overall review of the flu vaccination program at the university health clinic with recommendations. I will work with her to help make information available for her to be able to complete her project in a timely manner.

We strive to support staff and faculty at [Redacted] in the pursuit of furthering their education and are happy to work with Kristi for her capstone project.

Sincerely,

[Redacted]

RN, NP-C

[Redacted]

Director of Health Services
Appendix F: IRB Approval

CAGS IRB # 1045

I nstitutional Review Board

Human Subjects Project Review Form

If you are in the College of Adult and Graduate Studies, please submit completed forms to [redacted] in the Office of the Vice President for Academic Affairs.

If you are in the College of Undergraduate Studies, please submit completed forms to [redacted] in the Office of Academic Affairs.

PRINCIPAL INVESTIGATOR (Faculty Member) INFORMATION

Name: Kristi Hargrave, MSN, RN Email: khargrave@ [redacted]

College: CAGS Department: Nursing

Mailing Address: [redacted]

Project Title (Thesis): Examining Opportunities to Increase Flu Vaccine Uptake on Campus with a Focus on Pharmacy Partnerships

Proposed Start Date: As soon as approved Proposed End Date: November 2019

ADDITIONAL RESEARCH TEAM MEMBERS INFORMATION (If applicable):

Faculty Research Team Members: [redacted]

Student Research Team Members: [redacted]

Other Research Team Members: [redacted] Director of Health Services

FUNDING INFORMATION (If applicable):

Funding Agency or Research Sponsor: [redacted]

Funding Agency Mailing Address: [redacted]

Research Costs Involved: None

PROJECT DESCRIPTION

ABSTRACT (Provide rationale/ background in 150 WORDS OR LESS): This program review will examine a health clinic influenza vaccination program. A discussion with the director revealed a potential barrier of cost due to the health clinic not billing insurance for the fees of the vaccines. A program extension was done in October 2018 by partnering with the local branch of a national pharmacy chain [redacted] to bring in their services for the day on a volunteer basis to bill insurance. Impact of overall influenza vaccination numbers will be compared with the program extension verses historical numbers with no pharmacy partnership. I will explore the effects of the partnership to overcome billing issues, and give recommendations to continue, discontinue, or expand the partnerships for future years. Additionally, I will analyze the program based on current evidence based practices and make other recommendations for options to the college to improve outcomes for increased number of students obtaining vaccine on campus.
PROTOCOL (Describe procedures to which humans will be subjected; include survey copies): Records will be analyzed and overall numbers of vaccine given to students each year will be documented. No personal information or names of subjects will be recorded. Most of this project is a retrospective review, but data will be collected for this current flu season as well to obtain the overall numbers of vaccines given through the health clinic and pharmacy partnership through February 2019. I will also be interviewing the program director to discuss details of what she has tried in the past and what has and hasn't worked effectively. Additionally, I will collaborate with the pharmacy to gather data from the program extension as needed. I will write up the analysis and recommendations, and submit to finished document to my doctoral program at Abilene Christian University, and provide a copy for program director and her supervisor. Any suggestions/recommendations are optional and will be left to the discretion of administration and the current program director to implement or not for the future.

BENEFITS and RISKS: (Describe the benefits and risks to the individual and/or humankind.) Benefits of the program review include a detailed analysis that will be completed and handed to the program director to examine historical data and weigh the effects of partnering with the pharmacy for a flu shot clinic. Specific recommendations for marketing and student messaging will be included based off of the Theory of Planned Behavior and research identified from framing messages for students regarding flu shots. There is no risk of the program review itself to the students as this is a program review of retrospective data. The students previously chose to obtain the influenza vaccine or not through the health clinic or the offered partnership with Walgreen's pharmacy. The risk of the vaccine was not related to this project directly, as this project is to collect and analysis number of students who choose to get vaccinated previously or during this flu season.

CONFIDENTIALITY OF DATA: (Describe the methods to be used to ensure the confidentiality of data obtained, including plans for final disposition or destruction, debriefing procedures, etc.) Only numbers of total aggregate groups or student body will be collected, no individual names will be collected. I will work collaboratively with the program director to ensure privacy of all student records.

PARTICIPANTS:

A. This project involves the use of UNIVERSITY STUDENTS:
   ___ Yes ___ X No
   (*It involves the data only.)

B. HUMAN SUBJECTS from the following population(s) will be involved in this Study:
   ___ Minors ___ Pregnant Woman ___ Fetuses
   ___ Prisoners ___ Persons with Mental Disabilities

C. TOTAL NUMBER OF SUBJECTS TO BE STUDIED:

Data will be collected from the health clinic and pharmacy as numbers of an aggregate group, being the undergraduate student body. No names will be collected, only the numbers of students who took the vaccine. For example, it may be documented that 15 basketball team members obtained a vaccine through the health clinic within a given year. The overall number of undergraduate student body will also be documented to give a more accurate description of the percent of students who obtained a vaccine on campus during a given flu season. For example: out of a student body of x, x of students received a flu vaccine through the health clinic during the flu season of 2018-2019. The program review entails data collection of overall numbers of undergraduate students and numbers of
those who got vaccinated for influenza through the health clinic or pharmacy partnership as statistical data, and will not impact the students directly.

D. This project involves the use of Medical Procedures, Drugs, or Medical Treatment of any type: ___ Yes ___X__ No

This study would look at the number of students who receive flu vaccines offered from the health clinic and/or from other programs arranged on campus, such as the pharmacy flu shot clinic. This is a program review and it will only be making recommendations for change, not actually implementing the change. The partnership with the pharmacy was done on a volunteer basis this past month and has already been carried out. This project will analyze the outcomes and provide other recommendations for detailed options to improve flu vaccination numbers on campus.

If Yes, specify the medical procedures/drugs/treatment involved below:

E. This project involves possible harm to the subjects in the study:
   ___ Yes ___X__ No

While it is possible to have side effects or harm from an injection of any kind, this is only a program review and therefore, does not in and of itself increase risk for students. All vaccines are given by patient consent only through the health clinic or the onsite flu clinic outside of this project.

If Yes, specify the possible harm that subjects may incur below:

CONSENT: Please attach a copy of the CONSENT FORM(S) to be signed by the participant, any INFORMATIONAL LETTER subjects will receive, or any STATEMENT subjects will listen to.

There are no additional documents given to students specific to the program review.

OFF-SITE APPROVAL (Complete only if the project will be completed off campus):
___ I certify that this project will be completed on my site and will follow IRB guidelines.

Off-Site Administrator ___________________________ Date ___________________________

Printed Name ___________________________ Title ___________________________

Mailing Address ____________________________________________________________

SIGNATURES (Please check each item below to acknowledge agreement):
___X__ I certify that I have reviewed and agree to abide by the ethical requirements and procedures established by the IRB.
___X__ I certify that the protocol and method of obtaining informed consent as approved by the IRB will be followed during the period covered by this research project.
___X__ I certify that any future changes will be submitted for IRB review and approval prior to implementation.
___X__ I certify that I will notify the IRB when this project is complete.

A. PRINCIPAL INVESTIGATOR (CCU Faculty Member):

Printed Name ___Kristi Hargrave_____________ Date: 11/26/18_________________
B. RESEARCH TEAM MEMBERS:

1) [Name] Health Clinic Director
   Date

2) ______________________________ Date

3) ______________________________ Date

4) ______________________________ Date

C. DEPARTMENT CHAIR __________________________ Date

D. DEAN OF SCHOOL _________________________

IRB USE ONLY:

EXEMPTION REVIEW

PROJECT EXEMPT: X  PROJECT NOT EXEMPT: _____

IRB Member #1 Signature __________________________ Date: 11/27/2018

IRB Member #2 Signature __________________________ Date: 11/27/2018

EXPEDITED REVIEW

PROJECT APPROVED: _____ PROJECT NOT APPROVED: _____

IRB Member #1 Signature __________________________ Date: __________

IRB Member #2 Signature __________________________ Date: __________

IRB Member #3 Signature __________________________ Date: __________

FULL REVIEW

PROJECT APPROVED: _____ PROJECT NOT APPROVED: _____

IRB Member #1 Signature __________________________ Date: __________

IRB Member #2 Signature __________________________ Date: __________

IRB Member #3 Signature __________________________ Date: __________

IRB Member #4 Signature __________________________ Date: __________

IRB Member #5 Signature __________________________ Date: __________
FINAL IRB REVIEW

PROJECT APPROVED: X PROJECT NOT APPROVED: 

CAGS Chair, IRB Board ____________________________ Date 11/27/2018

Vice President for Academic Affairs ____________________________ Date __________

PROJECT APPROVED: _____ PROJECT NOT APPROVED: _____

CUS Chair, IRB Board ____________________________ Date __________

Vice President of Academic Affairs ____________________________ Date __________