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Provider Education Increasing Recommendation for Human Papillomavirus Vaccination

Tiffany Charest Skinner
Walden University

Walden University

College of Health Sciences

This is to certify that the doctoral study by

Tiffany C. Skinner

has been found to be complete and satisfactory in all respects,
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Review Committee
Dr. Mary Verklan, Committee Chairperson, Nursing Faculty
Dr. Geri Schmotzer, Committee Member, Nursing Faculty
Dr. Eric Anderson, University Reviewer, Nursing Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2020

Abstract

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By

Tiffany C. Skinner

MS, University of Tennessee, 2006

BS, East Tennessee State University, 2001

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2020

Abstract

Human Papillomavirus (HPV) was the most common sexually transmitted disease in the United States in 2018 according to the Centers for Disease Control and Prevention (CDC). The CDC established the Healthy People 2020 initiative for HPV vaccination uptake of 80% to effectively eliminate HPV associated cancers. The project site, a rural multispecialty clinic in the Mid-Atlantic United States reported a 3% vaccination compliance rate, well under the national average and the benchmark of 80% recommended by the CDC. The practice-focused question for this project was to determine how education of primary providers will increase recommendation rates for vaccination of HPV. Pender's health promotion model provided key elements to evaluating barriers to vaccination and developing strategies to overcome barriers to recommendation. The search engines and databases used for the educational framework on the vaccination recommendation improvement project included CINAHL, MEDLINE, ProQuest, and OVID Nursing Journal review. Search terms included *HPV vaccination, adherence, vaccination surveys, education, primary provider, health promotion, advocacy,* and *immunization barriers*. An urgency statement was developed as a 1-page significant information sheet on the facts about HPV, vaccination risks and benefits, and barriers to vaccination. The vaccination data report obtained from the DNP project multi-specialty site revealed that post urgency recommendation had improved from a 3% baseline recommendation rate to 100% for the in-office clinic visits. Vast positive social changes can be made to promote health as it relates to HPV infection and elimination of HPV associated cancers globally.

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Dedication

Christopher Skinner you are the inspiration in my life. God placed you at the center of my successes before they were known. I see that I became a nurse, a wife, a mother and a better person because of your devotion.

Also, I dedicate this work to my family who loved me through every step. My husband Chris, my children Autumn and Wyatt, my mother in law Joyce, and my mom and dad Donna and Corby for unconditional love.

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Dr. Eric Carlson my mentor and friend receives acknowledgment for unwavering support toward my success in my professional career endeavors and the DNP project on HPV vaccination. Our work is likely to continue as we share a passion in bridging gaps between nursing and medicine and believe vaccination to be an imperative public health focus in cancer prevention.

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Dr. Jeffrey Hirsh, fifteen years of shared respect. Tempus fugit.

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Section 1: Nature of the Project

Introduction

Human Papillomavirus (HPV) was the most common sexually transmitted disease in the United States in 2018 (Van Dyne et al., 2018). The Centers for Disease Control and Prevention (CDC) established the Healthy People 2020 initiative for HPV vaccination uptake of 80% to effectively eliminate HPV-associated cancers. Both men and women are being diagnosed with HPV-related cancers despite health care initiatives and provider awareness campaigns. With 14 million new cases per year in the United States alone, the American Cancer Society has made new a new goal for the year 2026 that would support that 80% of preteens 11-12 years old will receive the vaccine before their 13th birthday (Fedewa et al., 2018). In efforts to identify the barriers to meeting vaccination rates community leaders around the world have made poor HPV vaccination rates a global pandemic priority (Fedewa et al., 2018). Cervical and oral cancer diagnoses continue to reach numbers larger than 500,000 per year (Senkomago et al., 2017). There is significance in HPV vaccination as a public health problem because after more than a decade of HPV vaccination awareness, providers are still coming up short with recommendations to vaccinate (Niccolai, North, Footman, & Hausen, 2018). Recommendations to vaccinate have been identified as the most significant predictor of vaccination adherence among the preteen population, demonstrating how a provider-focused project will create social change (Niccolai et al., 2018). The DNP project was to create a platform to assess the barriers to HPV vaccination recommendation in the provider population and then deliver evidence-based urgency statements on HPV

guidelines that in turn will increase knowledge and reduce or eliminate barriers to recommendation. Section 1 will present the problem statement, purpose, significance, nature of the project and summarize the project objectives as they relate to creating a platform to educate providers towards recommendation of HPV vaccination.

Problem Statement

HPV infection is recognized by the CDC to be the most common sexually transmitted disease in the United States, with more than 14 million new cases confirmed every year in the United States (Cole, Thomas, Straup, & Savage, 2017). Our local problem focus is on assessing barriers to recommendations for prescribing the HPV vaccination within the primary provider population. Conducting a vaccination adherence project in a multidisciplinary clinic increases the feasibility of vaccination, as these clinics have certified family practice, internists, and pediatrician providers. The Mid-Atlantic region falls along a religious beltway in the United States that sets precedent for religious beliefs to impact vaccination adherence. Although categories for exemption include medical exemptions, in this region these exemptions only account for 0.4% of the total 4.1% of the total nonimmunized students, with the religiously exempt students making up the largest group of unvaccinated children in the county, at just under 2% (Capps, 2019). The project clinic identified itself as religiously based, and the providers reported affiliation to religious barriers to conversations that were in any way connected to sexual activity. Also, anti-vaccination protestors had strong emotional responses to risks related to vaccines, and providers had knowledge gaps about the risk-benefit profile for HPV vaccination specifically. Any decrease in vaccination adherence has been proven

to have a direct and inverse effect on risk for transmission of the disease (Capps, 2019). Perhaps the most significant measure for poor vaccination in the region is lack of access to care. Lack of access in this region can be explained by the rural nature of surrounding counties. The county health department reports that there are higher numbers of parents reporting lack of access to care related to time and travel to care centers as compared to anti-vaccination philosophies (Capps, 2019).

Evidence of a global pandemic has resulted in the CDC recommending HPV vaccination penetrance of 80% in the population as part of the Healthy People 2020 initiative, but efforts have proved futile as actual vaccination rates remain closer to 57% in the United States (Sussman et al., 2015). While researchers evaluate why vaccination adherence remains low, there is growing concern about HPV-related cancers. There are 33,000 cancers caused by HPV every year in the US, with an associated cost to treat noted to be greater than $7 billion (Fisher-Borne, Preiss, Black, Roberts, & Saslow, 2018). The World Health Organization (WHO) data indicate that despite vaccination efforts and screening these numbers are now globally reaching 570,000 HPV-related cancers in women and 60,000 cancers in men per year (St. Laurent, Luckett, & Feldman, 2018). If vaccination rates reach the 80% goal, vaccine models suggest that the HPV infection would be completely eradicated, and cancer deaths could be reduced to 20% globally (Brisson et al., 2016).

Purpose

Although many socioeconomic and behavioral factors have impacted the vaccination rates for HPV, it is the consensus that involving clinicians, parents, and the

adolescent patient in the discussion around vaccination will improve adherence (Cole et al., 2017). Lollier, Rodriguez, Saad-Harfouche, Widman, and Mahoney (2018) described how primary provider knowledge and support is a common theme to vaccination adherence and disease prevention. The project site has reported a 3% vaccination compliance rate, which is well under the national average and the benchmark of 80% recommended by the CDC. Although there are ample providers in the project site provider group treating preadolescent patients, poor vaccination adherence is a multifactorial problem. Vast social impacts can be made to positively promote health as it relates to sexually transmitted HPV and elimination of associated cervical and oral cancers locally and around the world. The practice-focused question for the identified problem of poor HPV vaccination rates was, Will educating primary providers in a multidisciplinary clinic on the current state of HPV result in increasing HPV vaccination knowledge and recommendations for vaccination of eligible preteens to 80%?

The practice-focused question was to determine how education of primary providers will increase knowledge and recommendation rates for preteen vaccination of HPV. There is significance in HPV vaccination as a public health problem because, after more than a decade of HPV vaccination awareness, providers are still not meeting the recommendations to vaccinate (Niccolai et al., 2018). Recommendation to vaccinate has been identified as the most significant predictor of vaccination adherence among this population (Niccolai et al., 2018).

Nature of Project

The search engines and databases used for an educational framework on vaccination recommendation improvement project included CINAHL, MEDLINE, ProQuest, and OVID Nursing Journal review. I also consulted trusted websites including the CDC, National Vaccination Advisory Committee (NVAC), the WHO, and Advisory Committee Immunization Practices (ACIP). Search terms included *HPV vaccination, adherence, vaccination surveys, education, primary provider, advanced practice nurse, nursing model and theories, health promotion, advocacy, lack of access,* and *immunization barriers*. Clinics with specialty providers have an inter collaborative approach and are increasingly likely to appoint vaccine champions, use standardized policies, and schedule appropriate time to visits scheduled for vaccination (Lollier et al., 2018).

The approach for the DNP project was focused on applying advanced practice nursing principles to make meaningful impacts in this area by disseminating and translating research. The use of Pender's health promotion model (HPM) provided key elements to evaluating perceived and actual barriers to vaccination and develop strategies to overcome barriers to recommendation (HPM, n.d.). The medical director provided oversight of the process in which the nurse vaccination champion provided vaccination data on how many vaccination recommendations occurred from participating providers in the month prior to my initial visit for pre-education preparation. The champion was a designated nurse trained in vaccination procedure who had access to an electronic database from which she obtained statistics on provider recommendations, numbers of

patient visits, and percentages of adherence to HPV vaccine recommendations. The nurse champion created and then printed the deidentified worksheet for me when I arrived for the pre-education phase of the project. Prior to my pre-education visit I made a project initiation visit and delivered the providers a pre-education survey titled "WD4019: You Are the Key to HPV Cancer Prevention-2018" to identify barriers to vaccination recommendation. The paper survey was adapted from an existing approved survey from the CDC, took less than 5 minutes to complete, was delivered to the nurse's station by the nurse champion and collected with no identifiers (Vaccines CDC, 2019). Providers completed the de-identified surveys and returned them to the nurse champion who placed the surveys in an envelope titled "Pre-Education Survey" and kept the completed surveys in her locked, private office until my return for the pre-education visit. The vaccination champion obtained the vaccination recommendation report and provided it to me during my visit in a separate envelope marked "Vaccination Recommendation Report". All the data were kept deidentified and secured in the private office of the nurse champion.

I collected and evaluated the data report, the results from the pre-education survey, current literature from the CDC and current peer reviewed literature in order to develop an urgency statement. The urgency statement was a one-page statistically significant information sheet on the facts about HPV, vaccination risks and benefits, and ways to overcome barriers to vaccination. The urgency statement on HPV and overcoming barriers was aligned with support from the literature with ways to reduce barriers as they have been identified from pre-assessment surveys. The pre-education phase of the project occurred over a 1-week period.

Visit number two occurred 1 week after the pre-education visit and marked the initiation of the education phase of the project. The medical director attended an educational in-service in the clinic breakroom along with providers on hand for patient care were given a copy of the urgency statement to use a guide over the next month in their clinical practice. I delivered the educational content from the urgency statement to the providers and the nurse champion in the centralized breakroom in the clinic. I presented the findings from the presurvey and the current data on the HPV virus, vaccines and barriers as they were identified on the survey in an open discussion format. I used a poster as an aid to present the information that aligned with the vaccine from the CDC as well during the discussion. The providers had an opportunity to ask questions during and after the in-service. The providers and clinic nurse were able to reach me via email if they had questions regarding vaccination recommendations or the material presented in the in-service for a month after the education phase. The education phase occurred over a 4-week period.

Visit number three occurred 5 weeks after the delivery of the urgency statement and evidence-based guidelines. During the post education visit I returned to the clinic to give the post education survey titled the "WD4019: You Are The Key to HPV Cancer Prevention-2018" to the nurse champion who delivered it to the providers to complete in the centralized nurses station. Providers completed the deidentified surveys and returned them to the nurse champion who placed the surveys in an envelope titled "Post-Education Survey" and returned them to me during my visit. The vaccination champion obtained the vaccination recommendation report from the electronic record and provided the results to

me during my visit in a separate envelope marked “Vaccination Recommendation Report”. All the data were kept deidentified and secured in the private office of the nurse champion. The data were transferred to an electronic spreadsheet that was password protected and encrypted to examine the breakdown of which barriers were chosen. Finally, the post education evaluation occurred 1 week after data were received from the champion and entered on the spreadsheet. I analyzed the data from the presurvey and postsurvey and the data on vaccination recommendation rates before and after education to evaluate if the educational in-service closed the gap on the knowledge deficit and reduced barriers to vaccination recommendations within the provider group. The total project time was 6 weeks from preassessment to analysis of the results.

The purpose of this project was to demonstrate that primary providers had a direct and positive influence on HPV vaccination recommendations and adherence. In-service and urgency statement delivery reduced barriers and closed the knowledge gap for providers responsible for HPV vaccination. Fisher-Borne et al. (2018) discussed how Federally Qualified Health Centers are eligible for grant monies for efforts to increase vaccination rates. Providers disseminate evidence-based practices by using collaboration strategies in strategic program development to ensure high levels of participation and demonstrate a positive return on investment to improve quality of care within the provider population in any wellness related program such as vaccination (Palumbo, Sikorski, & Liberty, 2013).

Significance

The primary stakeholder was the primary provider who benefitted in the education model for vaccination recommendation by supporting the Healthy People initiatives and supporting healthy living by preventing disease in their patient populations. The preteen patient and parents were the secondary stakeholders who directly benefitted from an HPV provider education by experiencing better wellness and health outcomes. Many socioeconomic and behavioral factors have impacted the vaccination rates for HPV, but it is the consensus that involving clinicians, parents and the adolescent patient as stakeholders in the discussion around vaccination will improve adherence (Cole et al., 2017). Lollier et al. (2018) described how primary provider knowledge and support is a common theme to vaccination adherence and disease prevention. The four recommended vaccines for adolescents are tetanus, diphtheria, toxoid/acellular pertussis (Tdap), meningitis, influenza, and HPV with adherence rates between 80 and 90% for the first two (Lollier et al., 2018). The discrepancy between the three commonly administered vaccinations and HPV vaccination is believed to be due to health care provider barriers including limited knowledge, the stigma around sexual activity discussion and young age, parental perceptions and lack of awareness (Cole et al., 2017). Therefore, educating the providers on the facts of HPV vaccination, risks, benefits and indications has in turn equipped them to have the same impact when discussing the topic with patients and result in higher vaccination adherence. Because HPV infections usually do not cause symptoms and transmission of the disease occurs from sexual behaviors, the preteen and parent must rely on the provider to openly

communicate about priority risk reduction (Cole et al., 2017). Therefore, the primary provider is primarily responsible for addressing these barriers to recommending vaccination and holds the most influence on outcomes (Niccolai et al., 2018).

Contribution of the DNP project can be accomplished by educating the providers in multispecialty care using health promotion frameworks. As a DNP, I can provide an urgent and informative delivery on the need for HPV vaccination and list facts related to possible side effects. I can also provide ways to remove or overcome barriers in order to open dialogue between patients, parents, and providers around risky sexual behavior and cancer prevention through nursing science and education models. Many attitudes and personal biases existed in the vaccination discussion, and educating using an evidence-based framework has demonstrated ways to limit bias in approaching the topic of vaccination with eligible preteens and their parents.

By effectively using an applied theoretical framework in nursing, such as the health promotion or health belief model, advanced practice nurses may in turn act as a liaison between disciplines and show application to clinical practice as education improves outcomes. The evidence justifies HPV vaccination as an imperative importance to the nursing profession. Assessing behavioral factors in healthy and non-healthy individuals is a key role for a professional nurse, as is the ability to help patients maintain health through educational measures or framework. When assessing how behavioral factors such as perceived risks and benefits to vaccination are relayed from provider to patient, Pender's HPM will provide the framework on which to base recommendations for change. Education projects striving to increase vaccination recommendations may be

transferred to other large-scale communicable disease prevention platforms. However, advanced providers understand that HPV-related cancers continue at a staggering rate because vaccination adherence remains less than 80% as recommended by the CDC (Sussman et al., 2015). To significantly reduce infections and eliminate HPV-related cancers, providers worldwide must remain advocates for their vulnerable patient populations locally and globally through education, policy advocacy and by avoiding personal bias and barriers to recommendation. Education frameworks can be used across disciplines to make the kind of positive and measurable impacts to prevent disease in nursing, medicine, social sciences, and beyond.

Vast positive social changes can be made to promote health as it relates to sexually transmitted HPV and elimination of associated cervical and oral cancers locally and globally. HPV infection is pandemic, and the intervention has the potential to make positive impacts on our local, national, and even global communities (Fedewa et al., 2018). Because HPV is a sexually transmitted infection, the healthcare provider focus should be on education regarding cancer prevention to necessitate adherence. As an in-service-related staff education project, measured outcomes to improve patient care and achieve standards of practice have become a part of the framework and program objectives for this clinic and included identifying the programs' impact on social change.

Summary

The CDC established the Healthy People 2020 initiative for HPV vaccination uptake of 80% in effort to effectively eliminate HPV associated cancers. Both men and women are being diagnosed with HPV-related cancers despite health care initiatives and

provider awareness campaigns. The primary project goal is to increase HPV vaccination recommendation rates for children aged 11-13 years by improving the vaccination knowledge and recommendations to greater than 80% in the month post education. Vaccination administration rates at the project site were reported at 3% over the last quarter, believed to be due to many behavioral barriers. The practice-focused question was, will educating the primary providers increase knowledge and recommendation rates for preteen vaccination of HPV. The use of Pender's HPM provided key elements of a framework to determine perceived and actual barriers to vaccination and develop strategies to overcome barriers to recommendations for HPV vaccination. The nature of the project was focused on health promotion activity through vaccination recommendation. Vaccination recommendation rates in the provider target population were evaluated using Pender's HPM assumptions around actual and perceived barriers. Social impacts were made to positively promote health as it relates to sexually transmitted HPV and elimination of associated cervical and oral cancers locally and globally. Section 2 presents the background and context for the DNP project by describing appropriate models and theory relevant to nursing practice and explaining the role of the DNP student within the context of program implementation.

Section 2: Background and Context

Introduction

The purpose of the project was to provide urgency-based education to multispecialty providers in order to increase their knowledge on the current standard of care for recommendations for HPV vaccination and identify and reduce barriers to HPV vaccination in the preteen patient population. The problem question was, will educating primary providers on the urgency and barriers to HPV vaccination increase HPV vaccination recommendation rates for preteen patient populations. The following section will discuss how Pender's HPM is an appropriate theory to demonstrate support for HPV vaccination recommendation and creating social change. Section 2 also identifies relevance to nursing practice application, gives local background and context, and elaborates on the role of the DNP student.

Concepts, Models, and Theories

The theory applied to the project is a middle range nursing theory that integrates nursing and behavioral science concepts called the Pender's HPM (McEwen & Wills, 2014). The HPM is an extension of the social cognitive theory, a grand theory evaluating behaviors within social science. The HPM holds assumptions that largely evaluate psychosocial behaviors of individuals and communities in order to engage them in learning new behaviors that are geared toward health promotion, not just illness avoidance (McEwen & Wills, 2014). Major concepts under the HPM include personal experiences and bias (McEwen & Wills, 2014). Behavioral considerations are the major underpinnings to the HPM. Behavior specific cognitions include perceived barriers and

benefits to action, perceived self-efficacy, activity related effects, interpersonal and situational influences (McEwen & Wills, 2014). Behavioral outcomes include the commitment to a plan of action that may be impacted by a person's preference and own health promoting behaviors (McEwen & Wills, 2014).

The HPM supported my vaccination recommendation program specifically by describing how vaccination recommendation enables the provider to encourage people towards disease prevention and engages individuals to take care of their community. Vaccines not only promote healthy behaviors, they also reduce rates for comorbid conditions that follow in population families, schools, workplaces and larger communities (Senkomago et al., 2017). Education on HPV also requires discussion on other health promotion activities, such as safe sex practices and screening with cervical exams (Senkomago et al., 2017). Individual provider behaviors and the culture within a provider practice may also place unseen barriers on the ability for providers to recommend the vaccine in eligible patients (Senkomago et al., 2017). By using the HPM, the DNP prepared nurse may then have the means to identify actual and perceived barriers of those providers responsible for recommending the vaccine. The practitioner will then gain insight into how to reduce or eliminate barriers identified in the survey to improve vaccination recommendation strategies. Nursing models in practice change allow a catalyst for advanced practice nurses to demonstrate a cross discipline application and close gaps in continuity of care (McEwen & Wills, 2014). While the providers in the target practice population will not be provided education on the model directly, they may have a general awareness of how barriers are perceived or otherwise can affect health

promotion. Discussing barrier identification and allowing for anonymous replies in surveys will reduce stigma, and possibly fear, as it relates to health promotion around sexual behaviors in the patient. The project is asking the provider to reflect on personal barriers to recommendation as well as the perceived barriers among the parent population for the preteen. The survey used measured the perceived barriers to vaccination from the provider viewpoint and does not reflect the opinions of the parents or the preteen adolescent directly.

Relevance to Nursing Practice

HPV vaccination holds relevance in nursing practice as evident by the continued incidence and prevalence of HPV infection despite social and political efforts. After more than a decade of vaccination awareness, clinicians are continuing to record low rates of vaccination adherence in practice (Niccolai et al., 2018). Recommendation to vaccinate has been identified as the most significant predictor of vaccination adherence among the pre-teen population (Niccolai et al., 2018).

Conducting a vaccination adherence project in a multidisciplinary clinic increases the feasibility of vaccination, as primary clinics have certified family practice, internists, and pediatrician providers (Niccolai et al., 2018). Clinics with specialty providers have an inter collaborative approach and are increasingly likely to appoint vaccine champions, use standardized policies and schedule appropriate time to visits scheduled for vaccination (Lollier et al., 2018). Vaccination services are provided through a nurse vaccination champion and office encounters. Considering age-appropriate demographics for HPV, the clinic had a vaccination adherence rate of 3% per month in a quarter year,

which is well under the national average and the benchmark of 80% recommended by the CDC (HPV Vaccines, 2019). Although there are ample providers in multispecialty group treating preadolescent patients, poor vaccination adherence is a multifactorial problem. Anti-vaccination protestors have strong emotional responses to risks related to vaccines and providers may have knowledge gaps about the risk-benefit profile for HPV vaccination specifically.

Perhaps the most significant measure for poor vaccination in the region is lack of access. Lack of access in this region can be explained by the rural nature of surrounding counties. The county health department reports that there are higher numbers of parents reporting lack of access to care related to time and travel to care centers compared to anti vaccination philosophies (Capps, 2019 para. 7).

The proposed project worked to fill in the gap to practice by using evidence-based practice standards. The standards of care that increase knowledge on the current state of HPV infection on the urgency statements during in-servicing were created from materials obtained from the CDC. By increasing knowledge on the problem of HPV infection and current standards to care for the provider, the project helped providers in turn become increasingly able to address the barriers to vaccination for their patients. For example, lack of access of care was identified as a significant barrier to vaccination recommendation and adherence. Once the lack of access barrier was identified, the provider referred to the urgency statement explaining to the adolescent that if they adhered to the vaccine before age 15, the recommendation protocol would be reduced to two injections from the standard three (Lollier, et al., 2018), thus, reducing trips to the

center for care and improving access. Advanced practice nurses are positioned to make meaningful impacts in vaccination compliance by disseminating and translating research on barriers to vaccine recommendation. The use of Pender's HPM provided key elements to evaluating for perceived and actual barriers to vaccination and develop strategies to promote social change (McEwen & Wills, 2014).

Local Background and Context

Locally, the public commissioner of health and the CDC have reported that although national HPV vaccination rates among eligible adolescent patients are recorded at 40%, our state records an uptake of vaccination of only 30% (HPV Vaccines, 2018). The problem of HPV infection is reaching 45% of the U.S. population and is anticipated to grow if states do not react to find vaccination compliance strategies (HPV Vaccines, 2018). Because recommendation to vaccinate is considered the number one predictor to vaccine acceptance, the vaccine initiatives have been a focus for providers and health systems across the country. In my state, and specifically at the multidisciplinary clinic where this project took place, vaccination recommendation rates have no monitoring policy. Tdap and meningitis vaccination adherence has grown to greater than 80% nationally as the initiatives for school-based admission programs have mandated vaccinations (American Academy of Pediatrics, 2019). While vaccination mandates are in place for Tdap, and meningitis, school systems across the United States have not mandated HPV vaccines related to the barriers around the sexually explicit nature of transmission (HPV Vaccines, 2018). In this region, barriers to recommendation include lack of access related to the rural location of the community and low socioeconomic

status that places adolescents at the threshold for poverty (Vaccines CDC, 2019). A multispecialty clinic in the region was identified to be a direct representation of the community's at-risk population. The clinic employs 21 providers including pediatricians, primary internists, nurse practitioners and physician assistants. A needs assessment revealed that there was no tracking system for provider recommendations to vaccinate. The vaccine adherence rate measured for the clinic in the preliminary assessment was found to be 3%. The premise for the project was based on the CDC's recommendation for HPV vaccination adherence to reach 80% (Vaccines CDC, 2019).

The federal initiative for public health on HPV vaccination is called the Hub and Spoke Initiative (AAP, 2019). In a collaboration with the CDC and the AAP, the Community Guide and the Hub and Spoke Initiative were formed. The priority of the Hub and Spoke Initiative is to focus on creating peer-guided accountability on strong provider recommendations for vaccination against HPV (AAP, 2019). The cultural, ethical, and legal obligations to promote wellness through vaccination becomes imperative in the framework of preventing the spread of HPV infection because infections are directly related to higher risk for cancer (AAP, 2019). With any illness that is spread through sexual transmission, a stigma and fear may be present, not just in the parental community, but the provider one as well (Fedewa et al., 2018). The DNP project is based on the Hub and Spoke initiative and legislation that focuses on prevention of disease by placing focus on provider recommendation strategies and peer to peer accountability (AAP, 2019).

The NVAC supports administration of the HPV vaccine at the same time meningococcal and Tdap vaccines are given, which is typically at 11 to 12 years of age (Cole et al., 2017). Because pediatrician providers have shown higher rates of vaccine administration awareness, the multispecialty provider clinic is an appropriate choice (Cole et al., 2017). Tdap and MCV4 vaccines are administered nationally at or above the 80% benchmark, but do not include needed counseling or implementation strategies to overcome behavioral barriers associated with HPV (Lollier, et al., 2018). While pediatricians vaccinate at higher percentages compared to family practice providers, the rates for HPV vaccines are higher for girls as compared to boys, providing additional claim that screening in cervical cancer has increased the gap to vaccination between the sexes (Lollier, et al., 2018).

Role of the DNP Student

As a DNP student completing a practicum in a related field of Oral and Maxillofacial Surgery, I have a favorable referral base and a productive interdisciplinary professional relationship for an HPV vaccination project. Due to the compressed timeframe for data collection, I was unable to collect data for the full 6 to 12-month vaccination open period for series completion. However, it was feasible to complete a one-month post education data collection and monitor for increased vaccination recommendation over five weeks. The pre assessment identified perceived behavioral barriers to vaccination. The survey was adapted from current provider-based survey after the literature review and titled “WD4019: You Are The Key to HPV Cancer Prevention-

2018." I provided paper copies of the pre surveys and reference list to the nurse champion and she delivered them to the providers in the clinic.

I evaluated the data report, the results from the pre assessment survey and the current literature from the CDC and current peer reviewed literature in order to develop an urgency statement. The urgency statement was a one-page statistically significant information sheet on the facts about HPV, vaccination risks and benefits and identify ways to overcome barriers to vaccination. The urgency statement on HPV and overcoming barriers was aligned with support from the literature with ways to reduce barriers as they have been identified from pre assessment surveys. I presented the findings from the pre survey and the current data on the HPV virus, vaccines and barriers as they were identified on the survey in an open discussion format. I used a poster as an aid to present the information that aligns with the vaccine from CDC as well during the discussion. The providers had an opportunity to ask questions during and after the in-service. The providers and clinic nurse were able to reach me via email if they had questions regarding vaccination recommendations or over material presented in the in-service for a month post education. I returned to the clinic to give the post survey titled "WD4019: You Are The Key to HPV Cancer Prevention-2018" to the nurse champion at which time she delivered it to the providers to complete in the centralized nurses station. Providers completed the de identified surveys and gave them back to the nurse champion to place in an envelope titled "Post Education Survey" and returned them to me during my visit. Finally the post education evaluation occurred over one week, this is when I assimilated the data from the pre and post survey's and the data on vaccination

recommendation rates pre and post education to evaluate for whether the educational in service closes the gap on the knowledge deficit and reduces barriers to vaccination within the provider group.

My personal motivation for developing a project in the area of HPV vaccination was based on personal experience. As a nursing student in college I recognized a friend had a hard non movable "lump" along the cervical chain. The lump was misdiagnosed initially, but ultimately was found to be a malignant squamous cell filled lymph node. The etiology for the node was deemed likely to be related to a high-risk form of HPV. I feel a moral obligation to apply scientific knowledge and assessment of the infection, transmission, prevention strategies, and ways to overcome barriers where it will make the most positive impact and compel social change. As an advanced practice nurse, I am aware of the responsibility to prevent HPV infection in pre-teens and sexually active adults alike. HPV may also lie dormant and cause cancers to develop years or even decades after exposure (HPV Vaccines, 2018). As I grow to understand barriers to vaccination inside each target population, I have learned that the healthcare provider recommendation makes the most impact toward adherence (Lollier, Rodriquez, Saad-Harfouche, Widman, & Mahoney, 2018).

Oropharyngeal, cervical, anal, penile, and vaginal cancers are all continuing to occur in the United States despite awareness of the disease (Vaccines CDC, 2019). Cervical cancers have trended downward over the last fifteen years but may be related to increased screening along with vaccination in girls (Lollier, Rodriquez, Saad-Harfouche, Widman, & Mahoney, 2018). There are currently no screening recommendations that

have been shown meaningful for other types of cancers in women or men (Lollier, et al., 2018). Barriers to vaccination are linked to demographics and socioeconomics (Cole et al., 2017). Communities should be educated on cancer prevention as a priority with HPV vaccination. The healthcare provider should stay up to date on current trends and speak knowledgably on cancer prevention. No person should suffer the consequences of a preventable cancer or related treatment, including surgical complications, swallowing difficulty, depression, pain, infertility, or any of the countless other potential life changing effects from chemo and radiation therapies (Coley, Hoefer, & Rausch-Phung, 2018).

Personal bias may exist related to the underlying passion I have for vaccination as a healthcare provider. I will address the bias by evaluating individual provider barriers without giving a personal context of accounts. It is my goal to identify provider barriers and use scientific knowledge from the literature to define ways to educate providers on ways to overcome their perceived or actual barriers without relation to anything outside of the research. By using the CDC education statements and modules on HPV vaccines I can avoid personal bias or interpretation.

Role of the Project Team

The project team consists of a medical director, nurse champion and the DNP student. The medical director had complete oversight of the process of data collection for the practice site and worked with the DNP student to liaison between the nurse champion and providers. The nurse champion works as a representative of the medical director and providers at the practice site. The nurse champion collected and stored all deidentified

data regarding HPV vaccination rates and delivered those to the DNP student prior to and post the education in-service visit. The nurse champion directed the DNP student to the nurse commons on the day of the urgency statement delivery and in-service.

Summary

By using theory and nursing health promotion models to build a provider education program I am positioned to make large social impacts in the area of HPV vaccination recommendation. Actual and perceived barriers to treatment have been shown to exist in the provider and patient groups within the context of vaccination outside of HPV. The same measures that are used in the CDC frameworks can be easily applied to the DNP project on vaccination. Because inter collaboration is an imperative part of research translation for practice, the DNP prepared nurse's role in any vaccination project is to ensure that all identified gaps in care delivery are recognized and that barriers are reduced or eliminated. Empirical knowledge in nursing has proven to be a motivating factor for many advanced practitioners looking to make change. By recalling life events and applying evidenced based practices to experience allows for a deeper impact to be made. Personal bias in project programs can be eliminated if the DNP uses research to close gaps and keep dialogue open between healthcare disciplines.

Section 3 discusses the collection method and study design as it relates to the problem focused research question. The research question of the DNP project asks how improving knowledge on HPV may improve provider recognition of barriers and recommendation for vaccination in the pre-teen adolescent. The section also provides an analysis and synthesis of the evidence as it relates to the project question.

Section 3: Collection and Analysis of Evidence

Introduction

Evidence of a global pandemic has resulted in the CDC recommending HPV vaccination penetrance of 80% in the population as part of the Healthy People 2020 Initiative, but efforts have proved futile as actual vaccination rates remain closer to 57% in the United States (Sussman et al., 2015). While researchers evaluate why vaccination adherence remains low, there is growing concern about HPV-related cancers. There is significance in HPV vaccination as a public health problem because, after more than a decade of HPV vaccination awareness, providers are still not meeting the recommendations to vaccinate (Niccolai et al., 2018). Because recommendation to vaccinate is considered the number one predictor to vaccine acceptance, the vaccine initiatives have been a focus for providers and health systems across the country.

In my state, and specifically at the multidisciplinary clinic where this project took place, vaccination recommendation rates have no monitoring policy. The context of HPV vaccine recommendation is supported by evaluation of the barriers. Barriers including cultural, ethical, and legal obligations to promote wellness through vaccination become imperative in the framework of preventing the spread of HPV infection, because infections are directly related to higher risk for cancer (AAP, 2019). Many public health initiatives have been formed that support education frameworks and peer-guided oversight that may prove effective in strategy development for HPV vaccination such as the Hub and Spoke Initiative. Section 3 will present the practice-focused question, the sources of evidence, analysis and synthesis, and summary of the DNP project.

Practice-Focused Question

Because HPV is a sexually transmitted infection, the healthcare provider focus should be on education regarding cancer prevention to necessitate adherence. Low vaccination administration rates at the project site, reported at 3% over the last quarter, are believed to be due to many behavioral factors. By educating the providers in the multispecialty clinic, I provided an urgent and informative state of the need for HPV vaccination and listed facts related to possible side effects. Many attitudes and personal biases exist in the vaccination discussion, and educating providers using an evidence-based framework demonstrated ways to limit bias in approaching the topic of vaccination with eligible preteens and their parents. Therefore, educating the providers on the facts of HPV vaccination, risks, benefits, and indications has in turn equipped them to have the same impact when discussing the topic with patients and result in higher vaccination recommendation rates.

The practice-focused question for the DNP project was, will education of primary providers increase knowledge and recommendation rates for pre-teen vaccination of HPV at a multidisciplinary clinic? By surveying the providers within the practice group, the advanced practice nurse identified perceived barriers to vaccine recommendation. The barriers identified within the presurvey were guided by Pender's HPM. The rates of HPV recommendation were measured before and after the education in-service, and I observed whether a correlation exists between education and recommendation rates in the provider group for their preteen patients.

DNP-prepared nurses are especially equipped to translate the research into practice-related change. By searching appropriate peer-reviewed sources for defined and approved frameworks, the advanced practice nurse drives quality in care delivery. I identified the multispecialty site for the project because the large numbers of multispecialty providers and eligible patients and the opportunity to apply the evidence for recommendation during patient visits. A medical director provided oversight the project and the nurse vaccination champion will deliver data on rates for vaccination recommendation. I obtained and secured clinic data through the vaccination champion and clinic visits occurred on three separate occasions over a period of 6 weeks.

Sources of Evidence

The search engines and databases used for an educational framework on vaccination recommendation improvement project included CINAHL, MEDLINE, ProQuest, and OVID Nursing Journal review. Search terms included *HPV vaccination, adherence, vaccination surveys, education, primary provider, advanced practice nurse, nursing model and theories, health promotion, advocacy, lack of access,* and *immunization barriers*. I conducted the literature search in 2019 with inclusion factors of articles published in peer-reviewed academic journals from 2014 through 2019. Boolean operators were *AND provider education OR immunization barriers* under the topic title of HPV vaccination recommendation. Exclusion criteria were publications from books or articles focused on vaccination in general terms outside of HPV. Articles written outside of the English language were also excluded. A total of 417 articles were located and 35 were used after a completion of a literature review matrix (see Appendix B).

Cole et al. (2017) assessed barriers to HPV vaccination and developed strategies to overcome them through education using the HPM. Using a mixed methodology interviews, surveys, and teaching points within the provider, patient, and parent population, the researchers measured a response to vaccination as a preventative measure and directly measured the effects of vaccination strategies on HPV infection rates (Cole et al., 2017). Results showed improved vaccination rates among centers with developed education methods for delivery of care (Cole et al., 2017). Evidence demonstrated that continued studies were needed to identify the cost effectiveness of using interviews and surveys as tools compared to treating HPV infection (Cole et al., 2017). The study is directly aligned with the DNP project study as it provides a framework for continuation in assessing how education impacts the rate at which HPV vaccination is being recommended among eligible patients.

Senkomago et al. (2017) performed a worldwide evaluation of HPV vaccination strategies and surveillance of screening methods as it relates to preventing HPV-related cancers. The researchers wanted to have a global lens into the problem of HPV and enlisted the help of the WHO and the Pan American Health Organization (PAHO) to provide recommendations on vaccination and screening. The role of nurse was noted as synonymous with caring and education around the world in areas of cervical cancer screening. Placing the nursing professionals at the forefront of education made them a crucial part of the Workforce Development team to help address disparities in cancer related HPV prevention strategies. Despite rural and low-income countries having lack of access barriers, the Global Initiative for Cancer Registry Development has a goal to reach

150 countries participating in advocacy and collaboration networks. HPV has been identified as the cause for nearly all cervical cancers, some of the vaginal cancers and most oropharyngeal cancers around the world (Senkomago et al., 2017). As HPV infection and related cancers are continuing to climb, global initiatives for surveillance and vaccination are becoming a priority (Senkomago et al., 2017). The DNP project is supported by the article because it demonstrates the need for education on vaccination through inter collaboration and advocacy efforts described in the project.

A systematic review article on policy changes in vaccination may be the most imperative strategy against the barriers of lack of access, parental social concerns, and bias within providers during vaccination visits (Haddad, Allen, Szkwarko, Forcier, & Paquette, 2018). Policy changes may support reducing or eliminating parental consent for vaccination, such as in Title X Authority, which enables teens to obtain oral contraceptives without parental consent, and would also promote school system involvement in vaccine administration at schools to be all inclusive of Tdap, flu, meningitis (Haddad et al., 2018). Concerns from parents such as “My daughter is too young to need the vaccine” or “The vaccine promotes early promiscuity” are addressed through policy support within the Title X Authority that reports it recognizes the “importance of confidential and preventative reproductive health to all adolescents” (Haddad et al., 2018, p. 13). The DNP project evaluates for barriers within the provider population and is supported by the article because the researchers describe how barriers to recommendation may be overcome if providers focus discussion around cancer prevention rather than sexual transmission and activity.

A mixed methods study evaluated the 15-year trends of cervical and oropharyngeal cancer, finding that as a result of screening and vaccine the cervical cancers have declined, but oropharyngeal cancers have continued to rise (Sussman et al., 2015). A clinician questionnaire was used to survey external factors and barriers that had potential influence on vaccination adherence. Sociocultural behaviors, media and policy were evaluated, and providers reported a variety of challenges to vaccination recommendation. It was found that only 9% of eligible adolescents received complete series to vaccination. Recommendations included a set of counseling strategies for overcoming identified barriers to vaccination recommendation. Researchers found that the results of this study were consistent with other recently published qualitative research studies (Sussman et al., 2015). Clinicians who focused on cancer prevention rather than sexual activity counseling had a stronger adherence to vaccination. The article supports the DNP project efforts to encourage provider recommendation by reporting the scientific state of urgency behind rising infection and related mortality. The project provides a scientific and statistical education on the state of HPV to educate providers and translate evidence to practice.

Niccolai et al. (2018) held structured interviews in 2015 with 32 clinicians using a thematic approach to evaluate the social impacts and barriers to HPV vaccination recommendation. It was found that a strong recommendation from a provider was highly motivating for the parent and patient in terms of vaccination adherence. Many of the providers surveyed reported a lack of urgency to recommendation. Emergent themes were identified from the questions that were asked in the interview on whether the

vaccine should be a mandate to healthcare or school attendance. Answers demonstrated that a lack of requirement status had an important influence on providers recommendation. Clinicians reported “it was not required for school, but we recommend it”, “if we could start with here’s the HPV vaccine. It’s required prior to ninth grade” and “That type of policy would help us.” Because the DNP project is directly surveying the provider population for barriers to recommendation for HPV vaccine this article serves as a direct example of how emergent themes within social barriers exist. The mid-range nursing theory in Pender’s Health Promotion Model was chosen as the projects framework for relating perceived social barriers into a care model evaluation.

A mixed method study was performed with the goal of examining the parental and health system barriers to HPV vaccination (St. Laurent et al., 2018). The two most reported reasons from parents on withholding vaccination from children were lack of knowledge and lack of recommendation from their provider. The health system barriers most frequently reported were lack of access and cost for series of vaccine (St. Laurent et al., 2018). St. Laurent et al. (2018) researchers explain how non personal barriers may also hold a role in lack of recommendations for vaccines. The DNP project is evaluating how barriers of all personal or non-personal factors influence behavior and the article gives support to addressing lack of access and cost in its assessment on the urgency statement.

Clinics with specialty providers have an inter collaborative approach and are increasingly likely to appoint vaccine champions, use standardized policies and schedule appropriate time to visits scheduled for vaccination (Lollier, et al., 2018). Evidence

supports a systems-process-outcomes evaluation because HPV is not a reportable disease. The CDC has an approved self-survey module for providers that has 5 questions on the epidemiology of HPV that will examine the providers' knowledge base of HPV and vaccination data that follows the CDC recommendation (Vaccines CDC, 2019). While the eligible age for HPV vaccine is 9-45 years, the CDC recommends that a two series vaccine be given at least 6 months apart to 11 and 12-year-old children. Data shows that two series vaccine protects best if received before age 15 or before sexual activity has started (CDC, 2019). Scientific data on the current state of national and global infection rates supports the translation for the DNP project. The urgency statement will be created from the most current data. The article provides scientific terms of when to deliver a vaccine recommendation and sets the evidence-based care template for which the providers in the project will make recommendations.

The American Cancer Society addresses the problem of poor provider vaccination rates/recommendations by working as a direct partner in health initiatives and program development in collaboration with CDC. A new set of initiatives have been created and approved with new goals for vaccination of HPV focusing on reaching 80% adherence by 2026 (Fedewa et al., 2018). The HPM considers how behavioral factors within the provider population affects whether the provider makes the recommendation to vaccinate. Providers may have their own personal beliefs or opinions that present as barriers to recommendation for HPV vaccine. Pender's HPM applies theory to address the disparities in health between males and females in receiving HPV vaccination. Lack of access to care is a barrier that plays an environmental impact depending on geographic

area lived when it comes to continued exposure to HPV and level of recommendation (Healthy People, 2020). The overarching theme for the DNP revolves around evaluation of how education may improve recommendation rates for HPV vaccination. With the national guidelines remaining consistent in encouraging providers to overcome barriers to reach 80% adherence, the article gives support to the project framework.

Evidence Generated for the Project

Participants

The participants within the multispecialty clinic have certifications in family practice, internal medicine and pediatrics. There are 21 providers in the clinic composed of seven nurse practitioners, eight physicians' assistants and six medical doctors. The clinic also benefits from the service of a full-time nursing care directive that encompasses 10 nurses and 1 nurse champion for vaccines. The providers maintain certification through their respective certifying agencies and are in good standing under the licensing boards. The practice is located centrally within the large rural community and serves as a referring health system to over 12 major hospitals in the area. The practice area is in a community in the Mid-Atlantic United States serving over 465,000 people within a 60 miles radius with an estimated 69,750 of those individuals being aged 6-18 years (Census Bureau, 2018). The clinic identifies itself as a multifaceted Christian based affiliate for healthcare.

Procedures

The medical director provided oversight in the process in which the nurse champion will provide vaccination data on how many vaccination deliveries occurred

from participating providers in the month prior to my initial visit for pre-assessment. The champion had access to an electronic data base in which she obtained data specific to HPV vaccinations in children ages 11-15 years old and provided the information as deidentified data. The nurse champion created and then printed the deidentified worksheet for me when I arrived.

The pre-education survey titled "WD4019: You Are The Key to HPV Cancer Prevention-2018" is a brief assessment tool that includes 5 multiple choice questions adapted from the CDC's online CE module that will take approximately 5 minutes to complete (see Appendix A). The questions evaluate the providers' knowledge base on the current statistics of HPV infection and evaluates behavioral barriers that discern perceived or actual barriers to recommendation for the vaccine. The vaccination champion delivered the survey to the providers while they work at the centralized nursing station. The providers completed the paper and pencil survey between patient evaluations. Providers consented to participate in the project with the completion of the anonymous survey. After the providers completed the survey, they gave it to the nurse vaccine champion who placed it in the envelope labeled "Pre-Education Survey". The nurse champion placed the completed surveys in a locked file cabinet within her private office.

I evaluated the data report provided by the nurse champion to compare the recommendation rate at the clinic for the HPV vaccine and related adherence rates to that of national CDC goal of 80% vaccine adherence. The results from the pre-education survey were reviewed within the nurse champion's office and kept secure in the locked

cabinet until project completion. The survey was used to identify specific barriers to recommendation and matched with statistical information regarding the scientific state of the HPV vaccine. For example, the providers answered that lack of recommendation comes from parental fear about possible adverse reactions from the vaccine, I placed information on the urgency statement that provides an evidence-based response to adverse reaction rates with the vaccine. The use of the evidenced- based literature provides support to each identified barrier.

To develop the urgency statement, a literature review was conducted using the Boolean operators AND provider education OR immunization barriers under the topic title of HPV vaccination recommendation. Inclusion criteria included articles with key search terms on provider education, statistics on HPV infection and vaccination recommendation strategies. The articles included provided support to the provider education model used in the DNP project and be dated between the year 2014- 2019. Exclusion criteria are articles that focus on vaccinations for other diseases that weren't HPV. Articles written in languages other than English were excluded. A literature review matrix was created and used to evaluate the literature. The urgency statement was a one-page statistically significant information sheet on the facts about HPV infection, vaccination risks and benefits to vaccination adherence. The urgency statement on HPV was aligned with support from the literature with suggestions on how to increase rates of vaccination recommendation. The medical director was identified as the practice representative and was responsible for reviewing the in-service materials and the urgency statement before delivery.

Visit number two occurred 1 week after the pre assessment visit. The providers working attended an educational in service in the clinic breakroom and were given a copy of the urgency statement to use a guide over the next month in their clinical practice. The educational content from the urgency statement was delivered to the providers and the nurse champion in the centralized breakroom in the clinic. Using a poster, I presented the findings from the pre survey and the current data on the HPV virus, vaccines and barriers as they were identified on the survey in an open discussion format. The providers also had an opportunity to ask questions during and after the in service. The providers were able to reach me via email if they have questions regarding vaccination recommendations or over material presented in the in-service for a month post education. The vaccine nurse champion also had my contact information. The education phase occurred over a four-week period.

Visit number three occurred 5 weeks after the delivery of the urgency statement. During the post education visit I returned to the clinic to give the post education survey titled “WD4019: You Are The Key to HPV Cancer Prevention-2018” to the nurse champion who delivered it to the providers to complete in the centralized nurses station. The providers completed the paper and pencil survey between patient evaluations. Providers consented to participate in the post survey with the completion of the anonymous survey. Providers completed the de identified surveys and returned them to the nurse champion who placed the surveys in an envelope titled “Post-Education Survey” and returned them to me during my visit. The results from the post education survey were reviewed within the nurse champion’s office and kept secure in the locked

cabinet until project completion. The vaccination champion pulled the vaccination provider recommendation percentages from the electronic record database and printed the report without patient protected information. The champion placed the report in a separate envelope marked “Vaccination Recommendation Report”. All the data was kept deidentified and secured in the private office of the nurse champion. Review of results occurred inside the nurse champions office only. None of the data sheets, surveys or vaccination reports were removed from the secured office at any time. The data was transferred to an electronic spreadsheet that was password protected and encrypted to examine the breakdown of which barriers were chosen and all paper documents were shredded.

Instruments

The National Committee of Immunization and Research (NCIR) and the ACIP have defined evidenced based guidelines for HPV vaccination that the CDC used to create the module (Health and Human Services, 2019). The CDC has a wide scope initiative for HPV vaccination and program that includes references and tools for clinicians contained in the HPV Toolkit and has an assigned approved Office of Management and Budget (OMB) # 0990-0379 expiration date 9/30/2020 (Health and Human Services, 2019). The tool titled “WD4019: You Are The Key to HPV Cancer Prevention-2018” included five major item sections of content that measures learning objectives in the areas of HPV vaccine as cancer prevention, indications for the vaccines in boys and girls, components of vaccine recommendations, relevant and compelling information on the vaccine for parents, and disease prevention risks and strategies

(Health and Human Services, 2019). The tool was reviewed by the ACIP and placed in the Morbidity and Mortality Weekly Report in February 2019 (Vaccines CDC, 2019). The tool was approved for Continuing Nursing Education credit by the American Nurses Credentialing Committee in April 2018 (ANCC) (Vaccine Education, 2018). The U.S. Department of Health and Human Services and the ACIP references the tool throughout the research and literature on HPV vaccination (Vaccine Education, 2018). There is no information listed regarding the instrument's reliability.

Protections

The project protects participants with the completion of human protection training completion, CITI certification and Walden IRB. Walden IRB form A was completed and submitted to be kept on file through the university. Systems used for recording and tracking data for the DNP project included data retrieval from the electronic record medical obtained by the vaccination nurse. Anonymity to the partner site name and location was maintained along with ethical standards for the DNP project. Consideration of barriers to vaccination included behavioral factors, and Pender's Health Promotion Model to consider individual experiences, perceived benefits, barriers, interpersonal influences, competing preferences and activity related affects to assimilate and develop an urgency statement will be used. Positive behavioral effects include early and appropriate access to vaccination age, therefore promoting full vaccination with just two injections instead of three, discussing cancer prevention and promoting health behaviors in adolescents and opening a dialogue about other sexual health behaviors and pregnancy prevention as well (Holman et al., 2014).

Analysis/Synthesis

The nurse champion recorded only the numerical percentages of the vaccination adherence rates at the clinic and kept the report stored securely in her office until I arrived to compare those percentages to eligible office visits. Statistical methods for evaluation included a t-test to compare the pre-education vaccination recommendation rates with the post education vaccination recommendation rates. However, the use of a correlation coefficient was not used to measure strength and direction between provider perceived barriers and recommendation rates as they independent variable of the study were not constant.

Analyzing and maintaining deidentified statistics was done on a Microsoft Excel spreadsheet. By using descriptive statistics to summarize the data placed in the spreadsheet I was able to measure whether the staff education model had meaningful impacts toward vaccination recommendation. Each answer chosen was counted and totaled on the spreadsheet. Answers from the pre assessment survey were used to calculate a total number of times it was chosen out of the total surveys received. The data from the vaccination recommendation reports and the pre-education surveys helped to define what urgency statement statistics were placed into the final urgency statement to be delivered during the in service.

The practice focus problem of poor vaccination recommendation was evaluated to discern if education through an in-service on the urgency of HPV vaccine improved vaccination rates. After the in-service, the results were reviewed to count how many times a survey answer was chosen. The pre survey and post survey responses were not

evaluated by a correlation coefficient to determine how barriers chosen compared with provider vaccination recommendation rates.

The evidence justifies HPV vaccination as an imperative importance to the nursing profession (Vaccines CDC, 2019). Assessing behavioral factors in healthy and non-healthy individuals is a key role for a professional nurse, as is the ability to help patients maintain health through educational measures or framework. When assessing how behavioral factors such as perceived risks and benefits to vaccination are relayed from provider to patient, Pender's Health Promotion Model provided the framework in which to base recommendations for change. As an in-service related staff education project, measured outcomes to improve patient care and achieve standards of practice was a part of the framework and program objectives for this clinic and will include identifying the programs' impact on social change. In order to analyze or assess quality in healthcare outcomes advanced practitioners consider the terms of restoring function and survival within the target group (Donabedian, 2005). The Donabedian Model is a three-pronged assessment in which the limitations must be described in relation to measured outcomes.

Summary

The purpose of this project was to demonstrate that primary providers have a direct and positive influence on HPV vaccination adherence through recommendation. In-service and urgency statement delivery reduced barriers and close the knowledge gap for providers responsible for HPV vaccination. Because HPV is a sexually transmitted infection, the healthcare provider focus should be on education regarding cancer

prevention to necessitate adherence. Vaccination administration rates at the project site initially reported were 3% and were believed to be due to many behavioral factors. The practice-focused question for the DNP project was, will education of primary providers increase knowledge and recommendation rates for pre-teen vaccination of HPV at a multidisciplinary clinic? By surveying the providers within the practice group, I anticipated identifying perceived barriers to vaccine recommendation. The rates of HPV recommendation were measured before and after the education in-service and I observed whether a correlation was appreciated between barriers and recommendation rates in the provider group for their pre-teen patients. The search engines and databases used for an educational framework on vaccination recommendation improvement project included CINAHL, MEDLINE, ProQuest, and OVID Nursing Journal review. 417 articles were located and 35 were used after a completion of a literature review. The literature review matrix was developed using the 8 major articles that supported the DNP project evidence on education toward vaccination. The project was carried out over a 6-week timeline and included oversight and approval from the practice medical director. Protections were made to ensure ethical standards and privacy by de identifying all three instruments in the project and the clinical site itself. Data was reviewed on site in the nurse champions private office space. All surveys and data collected were placed in an envelope and secured in a locked cabinet within the nurse champions private office. A statistical analysis with t-test comparisons between pre and post education groups was evaluated as well as the overall rate for HPV vaccination recommendation among the provider group.

Section 4 of the proposal discusses the findings and conclusions of the DNP project and reflects on the strengths and limitations of the project as it was implemented.

Section 4: Findings and Recommendations

Introduction

The CDC established the Healthy People 2020 initiative for HPV vaccination uptake of 80% in effort to effectively eliminate HPV-associated cancers (Vaccines CDC, 2019). Both men and women are being diagnosed with HPV-related cancers despite health care initiatives and provider awareness campaigns. Locally, the public commissioner of health and the CDC have reported that while national HPV vaccination rates among eligible adolescent patients are recorded at 40%, our state records an even lower vaccination uptake of 30% (HPV Vaccines, 2018). The problem of HPV infection is reaching 45% of the U.S. population and is anticipated to grow if states do not react to find vaccination compliance strategies (HPV Vaccines, 2018). Because the local region had demonstrated poor vaccination recommendation rates, the problem focus within the project was on assessing barriers to recommendations for prescribing the HPV vaccination within the primary provider population.

Conducting a vaccination adherence project in a multidisciplinary clinic increased the feasibility of vaccination, as these clinics have certified family practice, internists, and pediatrician providers. The gaps in practice have been confirmed through the Pre-Education Survey titled the "WD4019: You Are The Key to HPV Cancer Prevention-2018." Any decrease in vaccination adherence has a direct and inverse effect on increased risk for transmission of the disease (Capps, 2019). The practice-focused question for the identified problem of poor HPV vaccination rates was, will educating primary providers in a multidisciplinary clinic on the current state of HPV result in increasing HPV

vaccination knowledge and recommendations for vaccination of eligible pre-teens to 80%? The objective was to determine if education of primary providers would increase knowledge and recommendation rates for preteen vaccination of HPV. Section 4 presents the findings, implications, project team contributions and limitations that were made evident as a part of this quality improvement project.

Findings and Implications

The purpose of this quality improvement project was to provide multispecialty providers an evidenced based educational urgency statement on the current state of HPV infection and complete an assessment of barriers related to recommendation to vaccination in clinical practice. The framework of Pender's HPM was compelling toward creating evidence-based change as the framework promotes self-evaluation of perceived and actual barriers in health. The DNP project began with an assessment of how one multispecialty practice may improve their recommendation toward HPV vaccination after an education in-service and an urgency statement on HPV facts. The clinic has 21 multispecialty providers, including internal and family medicine physicians, pediatricians, nurse practitioners and physician assistants. The project included a review of the current HPV vaccination recommendation rate at the site and a pre-education survey that assessed the barriers to recommendation among the provider group. I developed the urgency statement for education in poster format for the in service after the data from the vaccination report and pre survey was evaluated. The urgency statement was developed by using the literature review matrix and the CE Module from the CDC (Vaccine Education, 2018).

Pre-Education Collection of Vaccination Data

Retrospective data from the electronic medical record (EMR) were collected by the vaccine champion for the month prior to project initiation to determine how many of the in-office adolescent visits resulted in provider recommendation of vaccination for HPV. The nurse champion provided the Pre-Vaccination Data Report to me for review in her office after she created a report by identifying the meaningful use checkboxes for HPV discussion in the electronic record. The providers would document their discussions on HPV vaccination with patients and parents by using the check box system. The nurse champion entered the key term "HPV" into the EMR to obtain the report for the 4-week period prior to the in-service. The report revealed that there were 808 adolescent visits of which 28 showed HPV vaccination recommendation through the checkbox system. The baseline vaccination recommendation rate for the clinic during in office visits was 3% (see Figure 1). Figure 1 shows the number of visits and recommendation rates for HPV eligible teens from the month prior to the project start date. The total recommendation rate did not consider the vaccine clinic visits if they were not associated with an in-office visit. The clinical site operates an independent vaccine clinic that does not track documentation check boxes on recommendations therefore the vaccine clinic visits were not included in reported vaccination data.

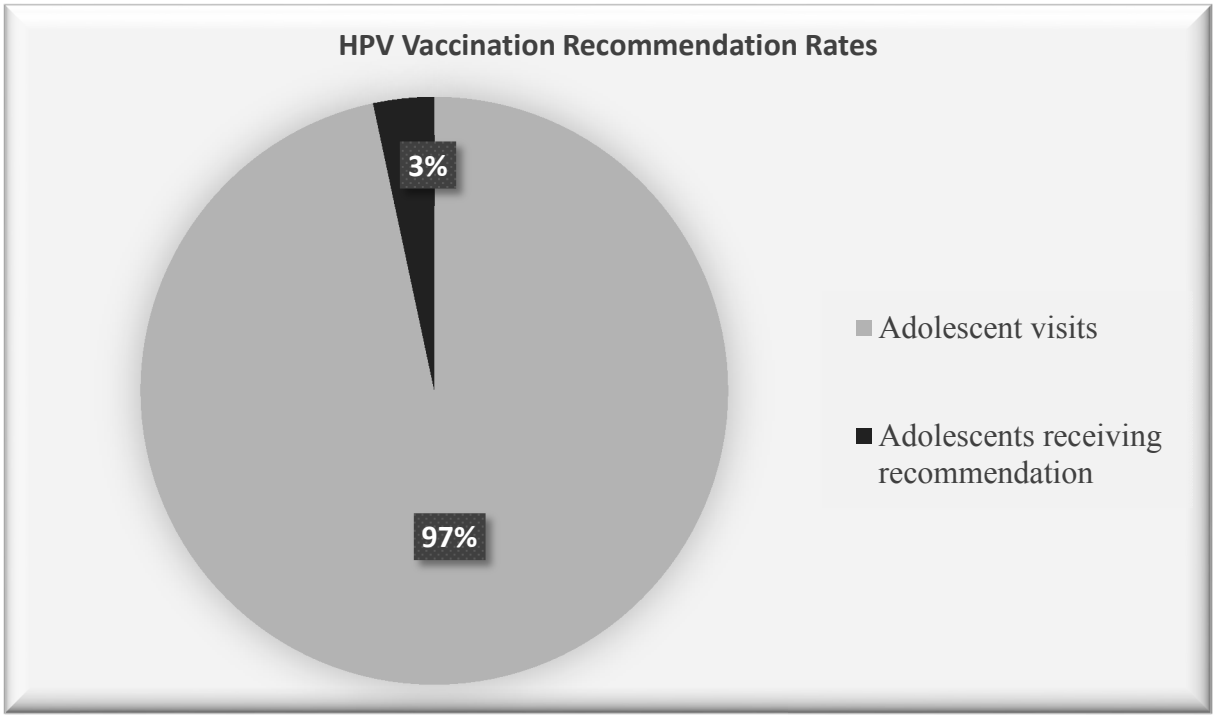

Figure 1. Multispecialty clinic visits and recorded adolescent visits with recommendation towards HPV at baseline.

As the DNP team leader, I transferred all data from the vaccination data report into a password-protected Excel spreadsheet. The baseline data report represents the total number of in-office visits, eligible teen visits, and total number of recommendations for HPV for the clinic over the 4 calendar weeks prior to the initiation of the project (see Table 1). The total number of monthly in-office visits for the clinic was 1,816 of which the number of eligible teen visits were 808. Twenty-eight of the 808 teen visits had a check box marked in the EMR representing a 3% recommendation rate for HPV vaccination.

Table 1

Number of In -Office Provider Recommendations for Eligible Adolescents at Baseline

Visit type	Patient visits (over 4 weeks)	Percentage
Monthly patients	1,816	
Eligible teen visits	808	45
Visits with HPV vaccine recommendation	28	3

Pre-Education Survey

Visit 1 occurred October 28, 2019 and marked the start of the project. The Pre-Education Survey was distributed by the vaccine champion to the nine providers on staff for patient care during that day. The vaccine champion placed the completed surveys in the Pre-Education Survey envelope and filed the surveys in her locked, private office for my review on site. The pre-education survey did not contain provider identifiers or patient information in order to maintain security and prevent bias in interpretation.

The providers were administered a Pre-Education Survey on the potential barriers to recommendation using a validated CDC tool and CE module titled" WD4019: You Are the Key to HPV Cancer Prevention-2018" (see Appendix A). The survey responses identified adverse reaction concerns and knowledge deficit as the largest barrier to recommendation (see Figure 2). Barriers of parental "anti vax" philosophy, parental consent, and religion were rated the same.

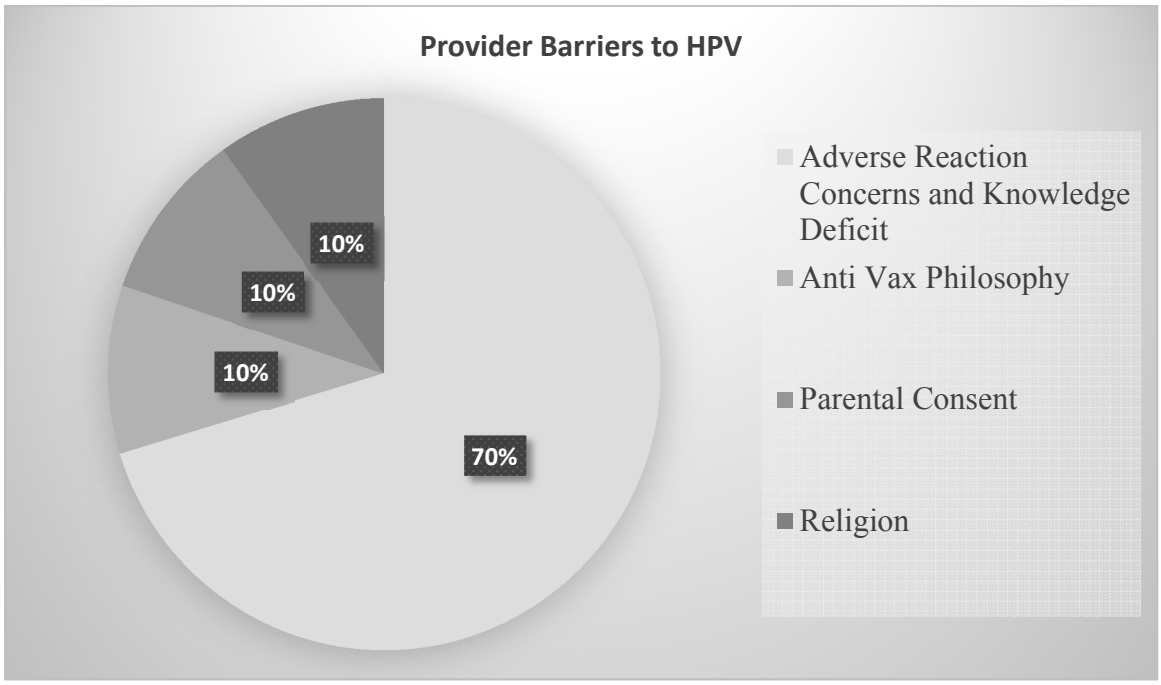

Figure 2. Pre-education survey on provider barriers to recommendation.

I used the barriers of parental consent, anti-vax philosophy, and concerns about adverse events to create the urgency statement as they were identified as the perceived most common provider barriers on the Pre-Education Survey. Of the nine providers present on visit 1, seven completed the pre-education survey. The barrier of religious affiliation was not directly addressed on the urgency statement outside of simply reporting that it may be cause for exemption within some parental groups.

Development of Education and the Urgency Statement

A literature review was conducted using the Boolean operators AND provider education OR immunization barriers under the topic title of HPV vaccination recommendation for the years 2014-2019. Inclusion criteria included articles with key search terms related to provider education, statistics related to HPV infection and HPV

vaccination recommendation strategies. The search engines and databases used to develop the educational framework for the HPV vaccination recommendation improvement project included CINAHL, MEDLINE, ProQuest, and OVID Nursing Journal review. Exclusion criteria were articles that focused on vaccinations for diseases other than HPV and written in languages other than English. Of the 417 articles that were located, 35 were used as references for the project. The literature review matrix was developed using eight articles that supported the DNP project evidence on education toward vaccination. The eight articles included on the matrix were chosen specifically because they reviewed existing education frameworks in schools or health centers making them applicable evidenced based support references for the DNP project.

Knowledge gaps related to adverse reaction potential were also identified in the provider group specifically regarding cancer occurrences related to HPV infection for boys as compared to girls. The urgency statement was created by matching education key points and objectives from the CE module from the CDC with the key findings on adverse reactions from the literature review matrix (Appendix C). The five objectives on the urgency statement aligned key concepts from the CE module from the CDC including, understanding how the clinics adherence rate aligns with the CDC healthy people 2026 goals on the indication for HPV vaccination in cancer prevention, explaining how to implement disease prevention strategies, such as bundling school aged vaccine recommendations, providing information to parents on the indications and safety profile on HPV vaccine, providing knowledge that HPV causes cancers in girls and boys including cervical, oropharyngeal, vaginal, penile, and anal cancers, and lastly explaining

components of effective recommendation and timing to vaccination (Vaccine Education, 2018).

Education Framework

Visit two occurred on November 4, 2019 during the second week of the project. At this time, the urgency statement was delivered in poster format. The poster was displayed in the general provider break space and I was available for questions. The medical director requested that there not be formal stop care meeting or in-service. The providers would independently come by the break room and review the poster as they were able on any workdays over the next four weeks. Because the providers on staff had limited time to spend with me during the in service and urgency statement delivery the medical director met with individual providers to give a review of the urgency statement. I was unable to ensure the information was delivered to each provider with a serious tone and sense of urgency due to the limited time and exposure I had with individual providers. The program design was that I would hold a brief conference collectively for providers on the second visit, which I was not given the opportunity to do. However, the gaps identified in visit one on the Pre-Education Survey were consistent with the gaps found in the literature from projects done in similar educational design. Along with barriers the providers surveyed on visit one also identified a gap in HPV cancer knowledge, therefore, the information used in creation of the urgency statement was appropriately aligned to close gaps and overcome bias. Suggestions for ways to address the areas of weakness to recommendation were described on the urgency statement. Providers would be left to review the urgency statement on their own accord during their

working timeline. The medical director explained that only nine of the 21 providers were on staff the day of project visit two, and because not all the providers employed at the clinic would have opportunity to hear the in service and education on HPV, that he would directly review the information with all of the providers. I provided a detailed in service on the HPV urgency statement and poster to him as the overseer of the clinic site and the vaccine champion placed the poster on the wall in the provider break room at that time.

Post Education Survey

After 4 weeks of project implementation, the third and final visit for the DNP project was December 2, 2019. The Post Education Survey was delivered through the nurse vaccine champion to the providers in the clinic providing in office visits that day. A total of five providers worked in the clinic this day with only four completing surveys. The four de identified surveys were collected by the vaccine champion and placed in the secure envelope titled “Post Education Survey”. The vaccine champion provided the surveys for my review in her private office. Upon review of the data from the surveys I recorded that three out four providers (75%) identified that adverse reactions from HPV vaccine and the knowledge regarding how to handle those questions was the largest barrier to recommendation (Figure 4). Concern regarding adverse reactions was the largest perceived barrier in the Pre-Education Survey responses as well. The anti vax philosophy was the only other perceived barrier for the post education group of providers, with two out four (50%) reporting anti vax philosophy as a barrier to recommendation. The pre-education barriers of parental consent and religion were not appreciated in the

post education survey group. As the DNP project leader, I transferred all deidentified data onto a spreadsheet on site before documents were shredded.

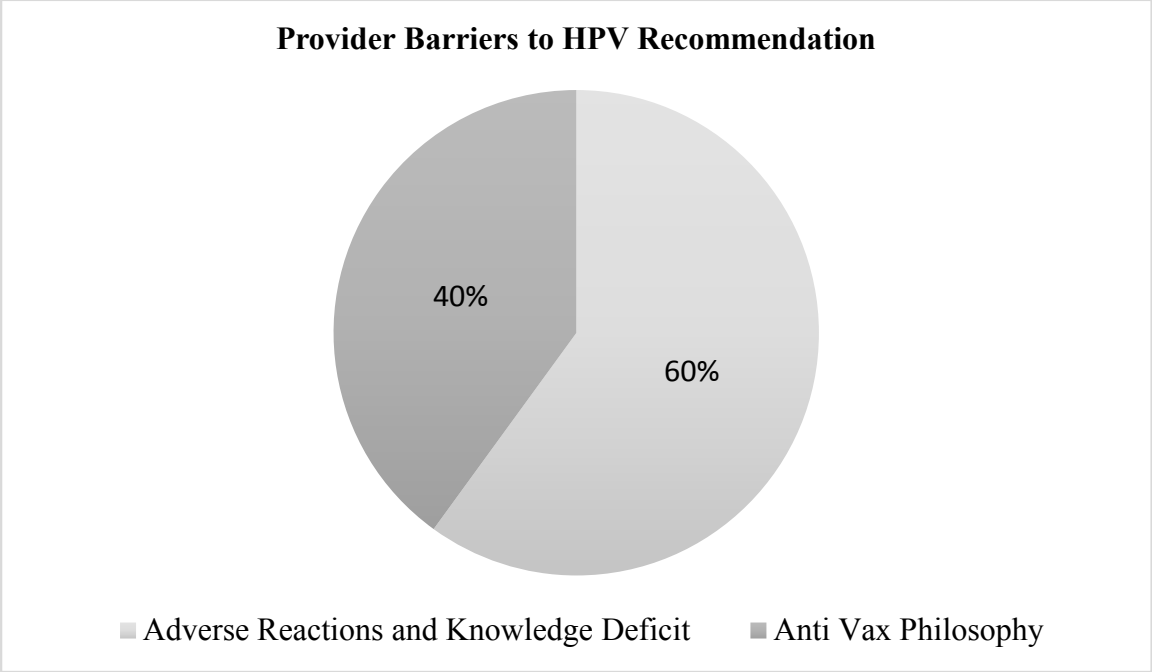

Figure 4. Post education survey on provider barriers to recommendation.

Post Education Collection of Vaccination Data

The Vaccination Data Report was printed by the nurse champion from the EMR and kept secure in her locked, private office until my review. Once the providers discussed HPV vaccination with the patient and parent, they were responsible for checking the checkbox associated with in office education on HPV noting criteria was met and project tracking was initiated. Over the four-week period from the date of urgency poster delivery the total number of eligible visits and corresponding visits with checkboxes marked were included in the report. The vaccination data report revealed a 100% vaccination recommendation rate for the post urgency in service time period (Table

2). Table 2 represents the total number of in office clinic visits, eligible teen visits and teen visits recorded with HPV recommendations for the four weeks since urgency statement delivery at the clinical site. The total number of in office adolescent visits for the post education month were 1,155. Of the 138 teen visits all 138 visits had recorded recommendation toward HPV vaccination as evidenced by check box tracking. Because this four-week time period was over a holiday week and less providers were seeing patients, the total number of eligible patient visits were reduced compared to the baseline data report.

Table 2

Number of In-Office Provider Recommendations for Eligible Adolescents During Post Urgency In-Service Time Period

Visit type	Patient visits (over 4 weeks)	Percentage
Monthly	1155	
Eligible teen visits	138	12
Visits with HPV vaccine recommendation	138	100

The recommendation rates were collected for the month prior to project initiation and then again collected during the one-month post urgency delivery for comparison (Figure 3). The baseline total monthly visits for adolescents were recorded much higher than the post urgency statement month. The discrepancy between recorded number of office visits pre and post project was believed to be due to a modified holiday schedule in November. Also, it is important to note the baseline month was a school start month and the clinic schedules a high number of school start visits for physicals and vaccines as

required by state and school health mandates. Recommendations to vaccinate have been identified as the most significant predictor of vaccination adherence among the pre-teen population, demonstrating how a provider focused project will create social change (Niccolai et al., 2018).

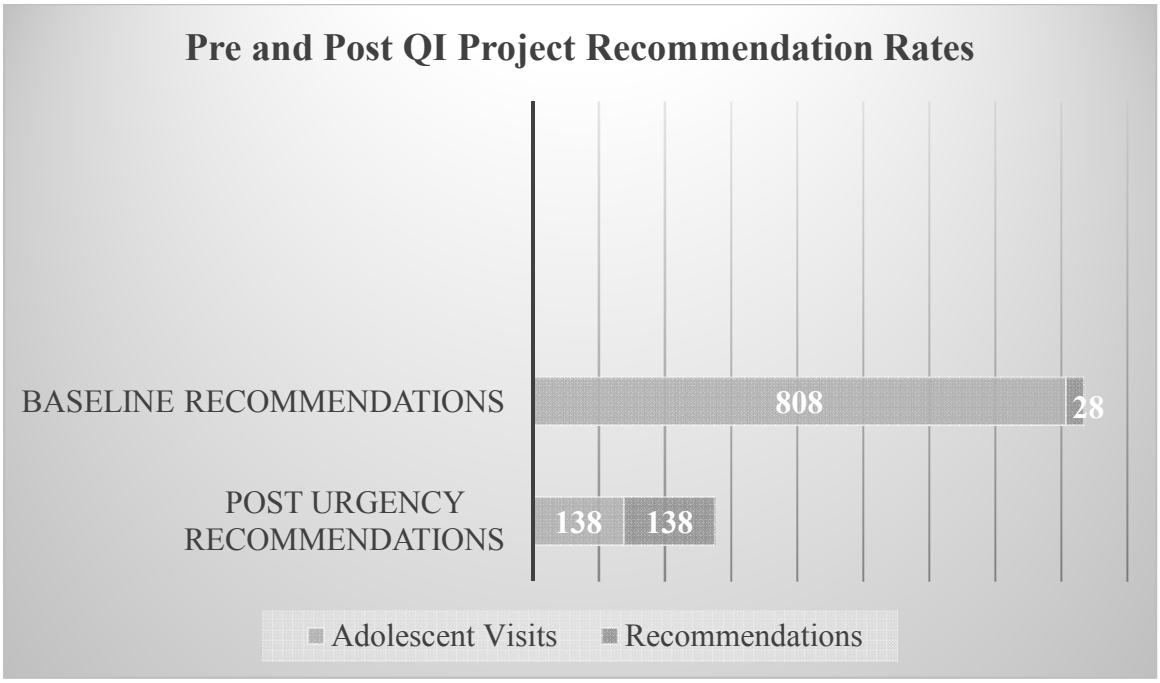

Figure 3. Multispecialty clinic recorded adolescent visits with recommendation toward HPV in the pre and post urgency project period.

Summary of Findings

There was a statistically significant improvement in the rate of recommendation for HPV vaccination after urgency statement delivery at the project site. The baseline recommendation rate for the site was based on check box documentation on HPV and was close to 3%. After education reassessment of the vaccination data for the four weeks post education and urgency statement delivery recommendation was documented at 100% for the in-office clinic visits. The increase in monthly recommendation was 82

additional recommendations or a 292% increase when comparing the post education time period to the baseline rate. The project objective was to measure the rate of provider recommendation toward the HPV vaccine for one month after urgency statement delivery and show a quality improvement in practice.

Recommendations

Individual Stakeholders and Policy

Stakeholders for the DNP project included providers, parents, and adolescents. Indirect stakeholders are the policy makers involved in creating solutions toward change regarding vaccinations. While evidence toward HPV vaccination effectiveness is deliberately sent to the public through media and trusted healthcare journals, providers continue to demonstrate barriers to recommendation of HPV vaccine. Ways to address the lack of access, associated costs of vaccination adherence and knowledge gaps on the topic of HPV are delivered to the mainstream public but do not always create buy in. With the anti vax movement in America and continued increase in rates of HPV-related cancers, it is imperative that policy makers get involved in legislation toward change. Healthcare policies work to allow for a concerted equal effort between state and federal agencies to promote safety and quality while managing the cost to afford achieving and maintaining of the vaccination adherence goal (France, 2008). The problem with the idea of federalism is the cost structure. While federal support is gained through CMS at a higher rate than what is expected of states, the idea of weighted control doesn't always fall into the hands of the federal entity. States are still very much in a fight to control decisions that are often deliberated on by the federal government when they individually

feel a loss of sovereign right to oppose any such policy (France, 2008). For example, the Patient Accountability Act was implemented with a fee if individuals chose to forego the purchase of health care, but states were quick to refute the fee and the demand for coverage (France, 2008). Current policy funding for vaccinations is supported by the CMS at a rate of 65% from federal sources and the remaining needs for cost coverage must be met by state taxpayers (France, 2008). Proposals have been made to increase the federal support from 65% to 72% but does not consider more control in decisions to practice (Medicare and Medicaid, 2015). To specifically appeal stakeholders to cost effective strategies, policies on HPV vaccination aim to consider as many state representatives as possible, I have met with my state senators and representatives to collaborate on solutions. The priority solution purposed is one that is feasible and measurable focusing on the creation of state legislation that supports the addition of HPV vaccination recommendation on physical examination forms for middle school aged kids. By implementing verbiage on recommendation into tracking EMR systems for providers, legislative measures may also encourage documentation of discussions with adolescents and parents. Other considerations include removing parental consent, implementing school programs or mandates, tightening vaccine exemption language, and expanding federal initiatives, such as Title X Authority, for adolescents (Orenstein & Yang, 2015). While the purposed solutions have potential to impact vaccination adherence, there is no one solution to creating buy in among stakeholders. The largest impetus remains education. The DNP project site currently uses physical forms that have been approved for reprinting and education from the American Academy of Family Physicians, The

American Academy of Pediatrics, the American College of Sports Medicine and the American Osteopathic Academy of Sports Medicine 2010 version #CI-191D (5/12). While the physical examination forms do not currently include any recommendation toward age appropriate vaccines, State Senator Dr. Richard Briggs proposes to add HPV vaccination recommendation to the physical examination forms. Other stakeholders to consider in policy advancement toward HPV vaccination recommendation would be the school board directors and the states medical association president for support.

Leading the way for advanced nurses, the American Nurses Association (ANA) is also a prominent leader in community health and advocacy. The ANA has endorsed the recommendation from the Expert Panel of Emerging Infectious Disease on the recommendation for the use of vaccines for disease prevention (American Academy of Nursing, 2014). CE nursing modules toward education on vaccine awareness and disease prevention are available for clinician nurses from the ANA in efforts to support up to date standards of care (American Academy of Nursing, 2014). Most recently the ANA released a statement of support toward the CDC's screening and treatment of Hepatitis C and is offering education for nurses and advanced providers on up to date treatment recommendations on both HCV and HPV (American Academy of Nursing, 2014). Because my state of practice remains a restricted practice state (T.C.A.63-7) and has made little advancement toward change in practice laws for advanced nurses in the last fifteen years, scope of practice legislation may become a secondary policy issue related to the project advancement that I pursue into my career (American Academy of Nurse Practitioners, 2019). The position statement from the American Academy of Nursing

2014 on the issue of infectious diseases and vaccination states “nurses should engage local, state and national leaders through advocacy and education” thereby increasing “awareness and access” within the communities they serve (p.372).

Clinical Sites and Change

The project site property has the potential to reach many eligible adolescents and their parents if providers would consider adding a vaccination education model to their walk-in and vaccine clinic. Currently the clinic does not have a formal way to track eligibility outside of age and the checkbox system. A check box system is not incorporated in the walk in or vaccine clinic that operates in conjunction with the main clinic. The walk-in clinic feels a duty to provide timely urgent and sick care evaluation to the community and does not place priority for HPV vaccination inside either of the ancillary clinics. However, with the numbers of potential adolescent visits occurring in the clinic it may be something to consider. Perhaps having a flyer on HPV to distribute at these visits would allow the parent to consider the vaccine on the next visit or schedule a visit in the vaccine clinic later. The vaccine clinic was not included in our project outcomes because the clinic lacked the ability to track education on HPV or recommendation. Currently the vaccine nurse can give vaccinations to those patients who call in independently for vaccination. Adding a tracking box and an educational flyer for both the walk in and vaccine clinic may also help the clinics move toward better vaccination adherence. Increasing services to more outreach and ancillary clinics may help to reduce lack of access to care and cost barriers by eliminating the socioeconomic or demographic evaluation of the adolescents only coming to routine office visits for

care. Feiring et al. (2015) explained how an association between parental income level and adherence to HPV vaccination is often noted indicating that higher income parents are more likely to have their child vaccination. In considering socioeconomic standing the provider should also consider health literacy of the parents. As an inference to income is often made by providers that connects income to education a careful health literacy review should be considered in educational intervention programs for vaccinations as health literacy and education do not always result in compliance of vaccination recommendation (Feiring et al., 2015). By placing the health professionals at the forefront of education, they became a crucial part of the workforce development team to help address disparities in cancer related HPV prevention strategies. Despite rural and low-income countries having lack of access barriers the Global Initiative for Cancer Registry Development has a goal to reach 150 countries participating in advocacy and collaboration networks. HPV has been identified as the cause for nearly all cervical cancers, some of the vaginal cancers and most oropharyngeal cancers around the world (Senkomago et al., 2017). As HPV infection and related cancers are continuing to climb, global initiatives for surveillance and vaccination are becoming a priority (Senkomago et al., 2017).

Support for Additional Clinics

While CMS and private payers are providing financial coverage at 65% of billable services, the federal government also focuses on evidenced based practices that reduce variation and are valid to translation in patient centered areas despite demographics (Medicare and Medicaid, 2015). Since larger financial support is delivered from the

federal government perhaps more control should be allotted therein and states should follow suit. The focus of CMS based principles strive to reduce health disparities and improve expansion of CMS services to all people, especially minority and vulnerable populations (Medicare and Medicaid, 2015). Federal support is evident in healthcare reform and is fostering changes we see in healthcare with the building of Accountable Care Organizations, giving way to transformation of primary care, integration of resources, payment reform, and developing strategies to measure quality (Medicare and Medicaid, 2015). Multispecialty provider groups such as the one in the DNP project can continue to work toward HPV vaccination recommendation long after the completion of the project. Focusing on the Hub and Spoke Initiative from the ACS helps providers hold each other accountable for recommendation. Reviewing the positions of other states in the US reveals Iowa and Rhode Island are the two states that have unrestricted access for adolescents under the Title X rule and have also been on the forefront of school-based vaccination programs and sexual education frameworks. Ruger (2008) describes how universal health care coverage is a crucial point to accessing high quality healthcare, as insurance coverage lends itself to more resources for the care needed and is a major economical barrier. Overall, increasing opportunities for multispecialty providers to recommend and deliver the HPV vaccine will help move policy forward toward improving adherence to vaccination but evidence suggests that providers would recommend more often with the backing in school entry requirement, like those policies that support Tdap and meningitis vaccines (Colgrove, Abiola, & Mellow, 2010).

Local and Global Communities

The WHO has worked with countries on a grand scale toward HPV vaccination as the infection relates to 14 million new cases a year in the US alone and 570,000 associated cancers (Altobelli, Rapacchietta, Profeta, & Fagnano, 2019). In the US we may believe that vaccines are evidenced based but must also consider (by state) who is going to fund such efforts (Eckenwiler, 2009). Barriers to vaccination in the US come in many forms, such as lack of access or cost or stigma. Within the US constitution we are presented a counterexample of perceived public health benefit and adherence (Colgrove, Abiola, & Mello 2010). An example of counter belief comes from the 1905 Jacobson Bill that describes how smallpox was eradicated. In 2006, the FDA approved Gardasil for girls to prevent HPV-related infection and associated cancers, and then in 2011 the recommendation for boys followed (HPV Vaccines, 2018). Healthcare leaders may address barriers to recommendation by focusing legislation efforts on development of vaccine policies or by incorporating stronger exemption language around several existing vaccine policies. Currently there are school entry mandates around the Tdap and meningitis vaccines that have resulted in adherence for vaccination to reach the 80% benchmark across the US (Perkins, Lin, Wallington, & Hanchate, 2016). Because the mandates have vague exemption terminology incorporated into them, parents can opt out of vaccination leaving the unprotected students at risk for disease transmission (Haddad, Allen, Szkwarko, Forcier, & Paquette, 2018). Language around existing mandates for school entry could be added to include HPV as a precedent for change. The exemption language could also be tightened to require religious clergy or medical exemption only,

removing the parental exemption (Orenstein, & Yang, 2015). Lastly, considerations toward writing expansion language around the federal Title X Authority to offset any discrepancy around socioeconomic standing may also aid in higher adherence to vaccination (France, 2008). The ACIP works with federal health agencies in developing the evidence to support recommendation standards and EBP practices (Colgrove, Abiola, & Mello 2010). After the FDA approved the use of the HPV vaccine for girls and boys, 42 states agreed to consider mandates for HPV vaccination, but only Virginia and the District of Columbia ultimately adopted the mandate. Rates for adherence remained 57.3% in girls and 34.6% in boys compared to other mandated vaccine related adherence rates with Tdap and meningitis of 91.3% (Orenstein, & Yang, 2014). The reason that, despite mandates, adherence is believed to have remained low, is the issue of loose verbiage around exemptions and individual rights (Perkins, Lin, Wallington, & Hanchate, 2016). Also, it should be noted that the current two states with mandates are only directed to the female population in school-based programs resulting in continued low adherence and support (Perkins, Lin, Wallington, & Hanchate, 2016).

The DNP prepared nurse specifically can work to increase knowledge among multispecialty providers such as dentists, pediatricians, PCP, NP's, to provide screening and vaccine delivery. The DNP prepared nurse also should assist in developing state policies and consider mandates for school entry-tightening exemption language by becoming involved in policy (Tyer-Viola et al., 2009). Clinical practice in specialty areas may benefit from an educational model that stresses urgency around HPV vaccination and cancer prevention. The DNP nurse has a moral obligation to maintain HIPAA around

vulnerable populations such as the adolescent. The DNP project addresses barriers to access to care and improving vaccination adherence can be accomplished through mandates or expansions in health programs. Maintaining HIPAA privacy laws and promoting cancer prevention and risk behavior modification in vulnerable adolescent populations continues to have ethical implications toward policy development.

Contribution of the Doctoral Project Team

The DNP project team consisted of myself, the medical director, and the nurse vaccine champion. The medical director provided oversight and approval for all data collection procedures and education delivery methods. The vaccine champion provided data reports and served as a liaison between the providers and the project leader. The Vaccination Data Report was printed by the nurse champion and placed in her private office for my review. A vaccination data report was printed from the EMR using the check boxes for HPV. The nurse champion collected and stored all deidentified data regarding HPV vaccination rates and delivered those to me prior to and after the education in-service visit. The nurse champion directed me to the nurse commons on the day of the urgency statement delivery and in-service.

Over the four-week period from the date of urgency poster delivery the total number of eligible visits and corresponding visits with checkboxes marked were included in the report. The nurse champion also reported that she informed providers how she would be tracking recommendation rates by using the meaningful use checkboxes in her report as part of this project. The vaccine champion noted that flu vaccine administration is up during winter months in the clinic and noted a significant increase in same day

referrals to the vaccine clinic within the first few days of the project during the post urgency in service period. The champion started tracking the available doses of the vaccines in order to prevent a limited supply or delay in administration. Adherence rates were added to the vaccination data report for my review. Although the adherence data was not tracked or included in the project outcome assessment as baseline data, the rates appeared to have meaningful significance showing that 60% (83/138 patients) of the patients receiving a recommendation for HPV did follow the recommendation given by their provider. Communities should be educated on cancer prevention as a priority with HPV vaccination. The healthcare provider should stay up to date on current trends and speak knowledgably on cancer prevention. No person should suffer the consequences of a preventable cancer or related treatment, including surgical complications, swallowing difficulty, depression, pain, infertility, or any of the countless other potential life changing effects from chemo and radiation therapies (Coley, Hoefer, & Rausch-Phung, 2018). To significantly reduce infections and eliminate HPV-related cancers providers worldwide must remain advocates for their vulnerable patient populations locally and globally through education, policy advocacy and by avoiding personal bias and barriers to recommendation (Sussman et al., 2015). Education frameworks can be used across disciplines to make the kind of positive and measurable impacts to prevent disease in nursing, medicine, social sciences, and beyond. Vast positive social changes can be made to promote health as it relates to sexually transmitted HPV and elimination of associated cervical and oral cancers locally and globally. HPV infection is pandemic, and the

intervention will have the potential to make positive impacts on our local, national and even global communities (Fedewa et al., 2018).

DNP Leaders as Team Members

As a DNP project leader, I was responsible for providing peer reviewed evidence-based practice recommendations to the practice site, communicating effectively with the medical director and acting as a liaison between the vaccine champion and project outcomes. I delivered an urgency statement poster and in-service to the medical director directly on the state of HPV infection and results from the providers surveys and vaccination data reports were de identified and discussed with the medical director. I transferred all data from vaccination reports into the Excel spreadsheet and shredded all project documents myself. Communication with the medical director and vaccine nurse was imperative throughout the project and was deemed effective by staying on the projected timeline for project. Outcomes from the project will be shared with the medical director by providing a copy of the final DNP project paper to the director once the paper meets committee final approval. Legislative Support is imperative for the advancement of policies brought forward by advanced practitioners (IOM, 2010). Using the lens of the McMaster Health Forum or EVIPNet framework the policy does show evidence of being informed and considers the main opposition stakeholders and supporters as well.

Strengths and Limitations

Although the clinic did not have a way of tracking vaccine recommendations through the walk-in clinic, I felt it was important to include all providers in the education framework within this project. All providers, even those working in the walk-in clinic,

occasionally rotated through the in-office clinic to see patients. Providers working in the walk-in clinic were included in the barrier assessment and were given the opportunity to review the urgency statement on HPV. The patients seen in the walk-in clinic were not included in the total recommendation assessment, but the provider would be prepared to educate and recommend the vaccine to their patients when they were being evaluated later in the in-office clinic. While the DNP project was able to demonstrate a quality improvement outcome for the clinic there were two major limitations in terms of access to the clinical site providers. First, limited numbers of providers were able to attend the in-service because the designed program was a one-day presentation and only the working provider group was able to hear the information on HPV urgency from me. The rest of the providers were relayed the information through the medical director upon their return to work. Initially, the project plan was to in service all providers on the HPV urgency statement through in-service. In service was limited to the provider group that was on staff the day of the scheduled in-service. The HPV urgency statement was delivered to the medical director and the in service was delivered to him directly. The full in-service was not presented to all the providers in the clinic. Because the pre assessment survey group and post assessment survey group were different groups of providers comparisons of barriers between groups could not be made. Regardless of these access barriers the medical director and the vaccine champion did relay all appropriate information to the staff and the HPV urgency poster was posted in the centralized area. A mixed methods study evaluated the 15-year trends of cervical and oropharyngeal cancer, finding that as a result of screening and vaccine the cervical cancers have declined, but

oropharyngeal cancers have continued to rise (Sussman et al., 2015). A clinician questionnaire was used to survey external factors and barriers that had potential influence on vaccination adherence. Sociocultural behaviors, media and policy were evaluated, and providers reported a variety of challenges to vaccination recommendation. It was found that only 9% of eligible adolescents received complete series to vaccination. Recommendations included a set of counseling strategies for overcoming identified barriers to vaccination recommendation. Researchers found that the results of this study were consistent with other recently published qualitative research studies (Sussman, et al., 2015). Clinicians who focused on cancer prevention rather than sexual activity counseling had a stronger adherence to vaccination (Sussman et al., 2015). The article supports the DNP project efforts to encourage provider recommendation by reporting the scientific state of urgency behind rising infection and related mortality. The medical director and the vaccine champion instructed the providers on appropriate documentation that was a perceived positive and independent result of the project. While documentation may be a large part in the overall increase in recommendation rates, it is believed to have improved the practice process on tracking education and likely will improve reimbursement from payers, however, the reimbursement improvements were not evaluated as part of the project.

All data reports and surveys were collected and reviewed during the appropriate timeline. Overall the goal of increasing provider recommendation to HPV is demonstrable within this project, as 82 additional recommendations were charted during the post urgency four-week time period. Secondly, because visits on vaccination

recommendation were tracked only through the check box system, the clinic was also unable to track any separate visits that occurred as a result of a walk-in clinic or vaccination clinic visit. Our project only measured recommendation rates that occurred through a scheduled visit check box evaluation. Clinics with specialty providers have an inter collaborative approach and are increasingly likely to appoint vaccine champions, use standardized policies and schedule appropriate time to visits scheduled for vaccination (Lollier, et al., 2018). Evidence supports a systems-process-outcomes evaluation because HPV is not a reportable disease. The CDC has an approved self-survey module for providers that has 5 questions on the epidemiology of HPV that will examine the providers' knowledge base of HPV and vaccination data that follows the CDC recommendation (Vaccines CDC, 2019). While the eligible age for HPV vaccine is 9-45 years, the CDC recommends that a two series vaccine be given at least 6 months apart to 11 and 12-year-old children. Data shows that two series vaccine protects best if received before age 15 or before sexual activity has started (CDC, 2019).

A limitation to provider recommendation may have been that at baseline the providers were not told how information on how tracking documentation was relayed to the project leader. If the providers were recommending HPV vaccine before the project, but were not documenting through the checkbox system, the poor tracking could have been an explanation for why the rates of recommendation were reported to be so low (3%). The American Cancer Society addresses the problem of poor provider vaccination rates/recommendations by working as a direct partner in health initiatives and program development in collaboration with CDC. A new set of initiatives have been created and

approved with new goals for vaccination of HPV focusing on reaching 80% adherence by 2026 (Fedewa et al., 2018). The HPM considers how behavioral factors within the provider population affects whether the provider makes the recommendation to vaccinate. Providers may have their own personal beliefs or opinions that present as barriers to recommendation for HPV vaccine. Pender's HPM applies theory to address the disparities in health between males and females in receiving HPV vaccination.

Section 5: Dissemination Plan

Introduction

The multispecialty clinic has demonstrated the importance of the assessment of barriers toward vaccination using the Social Cognitive Theory and Pender's HPM to measure how education influences provider rates of recommendation to create change in the outpatient setting. Measurably higher rates of HPV vaccine recommendation occurred in educational frameworks. Clarifying the audiences and venues that would be appropriate for dissemination the QI project enables me to make impacts to the broader nursing profession and healthcare's social platform in our community. In Section 5, I will discuss how the DNP project will define how I may translate the QI findings into meaningful application into clinical sites and within the nursing profession. The QI outcomes proved to have public health implications toward prevention of disease and associated cancer. The focus for forward movement in change will be in policy advocacy and creation of legislation around vaccination and provider documentation platforms.

Institution Plan

The final DNP project results were shared with the medical director overseeing the project. All documents, surveys, and deidentified worksheets were reviewed by the director before the findings were summarized. Specifically, I reviewed the figures that I created for the Findings and Implications section of the project showing how the vaccination recommendations increased after education. The figures created to explain provider barriers were also reviewed with the director. Our meeting was a brief one-on-one interaction, and the figures aided me in delivering a timely and poignant review of

the outcomes of the study. I provided the medical director with a copy of the figures to share with the clinical practice group. The key to ensuring the project results were representative of the evidence meant that I was able to translate the findings in a meaningful way. Stakeholders and end users within any health care practice area must demonstrate the ability to recognize practice problems and translate evidence into solutions (Leung, Trevana, & Waters, 2014).

Nursing Profession Dissemination

The ANA 2014 described how advanced nursing leaders are especially equipped to translate research into clinical practice by using patient centric advocacy, education and leadership to improve healthcare delivery to patients and communities. I have used the DNP essentials to explicitly gain liaisons in healthcare to bridge the gaps in knowledge and policy toward improved patient care outcomes. My DNP project mentor and I have used the research to show the need for change in vaccination efforts and recommendation in providers within our community. The focus on HPV vaccination has turned from prevention of an STD to a cancer prevention modality. Although advanced practice nurses understand the ongoing barriers that exist in our state and our nation, we also are increasingly equipped with ways to overcome these barriers. The nursing profession stands as the base I may rely on to have my voice heard in a post empirical viewpoint. Placing nursing professionals at the forefront of education makes them a crucial part of the Workforce Development team to help address disparities in cancer related HPV prevention strategies (Senkomago et al., 2017). Senkomago et al. (2017) described how despite rural and low-income countries having lack of access barriers, the

Global Initiative for Cancer Registry Development has a goal to reach 150 countries participating in advocacy and collaboration networks. HPV has been identified as the cause for nearly all cervical cancers, some of the vaginal cancers and most oropharyngeal cancers around the world (Senkomago et al., 2017). As HPV infection and related cancers are continuing to climb, global initiatives for surveillance and vaccination are becoming a priority (Senkomago et al., 2017).

Analysis of Self

Practitioner

Using program evaluations sets the framework for the DNP who are positioned to move change forward, create buy in, and implement leadership by calling on assimilated program design and programs to bridge gaps in systems and demonstrate the need for change (Pritham, 2016). An example of a QI program design is knowing how to develop validated or standardized tools and incorporate those into practice settings. The CE module from the CDC tool has been validated in the literature and now is translated to use through the vaccination recommendation process and is considered a program design and evaluation. As a practitioner, I often used technology and HIT frameworks to document my care. Through the DNP project, I have come to understand how HIT develops standards to track and evaluate both disease specific data and tracks provider treatments and standard of care delivery. If the urgency statement on HPV is validated into an electronic platform, the data can be tracked from provider to provider and the system could even drive outcome measures to patient knowledge setting the bar for the level of understanding required before undergoing vaccination (Sherrod, & Goda, 2016).

There are cost-reduction implications to these systems that have yet to be evaluated as part of DNP project.

Scholar

As with the other quality improvement projects I have worked on throughout the practicum, using QI methodology proved to have positive effects on my ability to demonstrate leadership and create change. I have always valued the transformational leadership skills that come from being able to show how research and validated tools may be implemented into practice. For the practicum this term, the leadership strategy behind research translation and collaboration reached new application. The research that I did on HPV vaccination strategies was shared with my mentor. Dr Carlson is a speaker for the Head and Neck Maxillofacial Department and was a guest speaker for the Big 4 Cancer Conference held in the region where he delivered a speech on HPV-related cancers and cited my research to deliver up-to-date status on the infection and prevention strategies. I feel that I have been able to share my knowledge on research translation and effective collaborate in a multidisciplinary way throughout the DNP project. The DNP as a policy developer holds a key position as part of the healthcare team and should understand current policy and barriers to work on topics such as vaccination before moving forward to make a stance against or for a purposed change (IOM, 2010). Tenn. Code. Ann 68-10-104 aims to give Tennessee adolescents care for STDs upon diagnosis but does not explicitly state vaccination as part of STD prevention or cancer prevention as an option to access (English, Bass, Boyle, & Eshragn, 2010). The Tennessee Attorney General has worked with Tennessee to define a “mature minor rule” for personal consent allowances.

The rule states that minors between the ages of 14-18 have a specific "capacity to consent" for treatments centered around contraception, prenatal care, STD treatment and screening, and drug and alcohol addiction (English et al., 2010). As a DNP student scholar, I have come to understand how transformational leadership may aid in the translation of EBP to clinical practice. Guidelines of transformational leadership suggest that new practice standards should include development of a team developed vision statement for clinical practices. The use of a vision statement in PICO format supported engaging nonbiased care and provided leaders a framework to deliver the essential characteristics of education and recommendation toward vaccination. Applying empathy towards healthcare workers translated into inspiring quality care delivery to patients (Abdullah et al., 2014).

Project Manager

The *Future of Nursing Report* from the IOM aims to provide support for ongoing education and quality improvement projects that can measure positive patient outcomes (IOM, 2010). In the DNP project, I believe managing the project on HPV vaccination recommendation helped the project site toward application and evaluation of their personal delivery style of HPV vaccination information and helped them adjust to gaps in knowledge of personal bias. The pre- and post-education survey tool was a nonthreatening way to measure barriers to vaccine recommendation without penalty. In today's healthcare model of declining reimbursement identifying strategies to improve delivery is an important support needed for providers. The multidisciplinary efforts in the primary provider HPV vaccination recommendation project were helpful to me as a DNP

student. My leadership style allowed for increased collaboration efforts to be implemented and helped the attending doctor see how the utilization of a team in teaching was better than a single NP project initiative. The additional support of the team members was vital to the success of the project. The clinic does not use an electronic tracking system in all ancillary clinics, which is a major limitation to measuring outcomes and demonstrating tool effectiveness to stakeholders for ongoing projects. Whereas if the EHR was implemented in all branches of the clinic and not solely the routine office visits, the information and effects on outcomes would be more easily shown.

Challenges and Insights

Project barriers of lack of knowledge and time were the main provider focused barriers to implementation of the project. However, providers support the idea of transcending self-awareness and team approach that is required for change (Leonard-McRae, 2017). The EBM used current knowledge, skill level, and attitude assessment through psychological questionnaires to develop the need for common barriers to recommendation to HPV vaccine in practice. By using the HPM Model, Transformational Leadership and EBM the practice can continue patient improvement outcome measures, apply knowledge translation by developing a common vision statement and recommendation and reduce variation in care delivered creating strong interpersonal relationships and positive workplace culture (Leung et al., 2014). In quality improvement change projects, success or failure comes from internal factors that include the project leader's ability to demonstrate urgent vision, engage other leaders, gain resources toward change and demonstrate measurable outcomes (Solberg, 2007). Solberg

2007 explains how transformational program design is crucial to the success of patient centric change. For pedagogical intervention in the population of multispecialty providers to show a way to measure improvement in outcomes and is geared toward engaging systems, employee and patients alike toward change. QI projects, when done effectively, increase levels of knowledge in the patient. The strategies toward inter professional collaboration were strongly implemented with stakeholders on this project including IRB, clinical providers, medical director MD, the vaccine champion nurse and APN and patient revealing potential benefit for ongoing research (Braithwaite et al., 2013)

Patient centered care integration relates to programs that increase efficiency and quality (Garcia, et al.2019). DNP professionals measure, document and evaluate the effectiveness of recommendation, therefore, effectively follow a quality improvement methodology. There are no directly visible barriers within the context of the project site as all stakeholders demonstrated acceptance for the project and assessment process. Funding around movement to EHR checkbox systems was not discussed in ongoing change projects. The project facility has adopted an EHR to comply with CMS meaningful use guidelines, therefore, any additional electronic support would be easily incorporated into the existing system despite some additional costs.

Summary

It was the aim and purpose of the DNP project to use an educational framework to assess a QI outcome toward provider recommendation rates toward HPV vaccination. The project did reveal a QI outcome in the multispecialty clinic site revealing compelling data that links higher rates of recommendation toward vaccination in provider groups that

receive a framework in which to become educated about HPV vaccination. The urgency statement developed for the project provides support from resources validated by the CE module from the CDC and ACS initiatives. The Healthy People Goals of 2026 serve as a reminder for clinicians in multispecialty clinics to refer to in efforts toward vaccination recommendation that encourages all adolescents receiving vaccination before their 13th birthday (Fedewa et al., 2018). The urgency statement created for this project incorporates all current state of science on HPV vaccination as a primary cancer prevention strategy. As HPV-related cancer incidence continues to climb and transmission of disease has reached 45% of the adult population in the US, the urgency of HPV vaccination is requiring translation to practice strategies like those suggested in the HPM pedagogy applied for our project (Senkomago et al., 2017). It has been projected that nearly all sexually active adults will have been exposed to HPV in their lifetime and now is the time for prevention through vaccination to become a national standard to care here in the United States and abroad. There is a direct and measurable link between recommendation for HPV vaccination and adherence to the vaccine (Niccolai et al., 2018). If vaccination adherence reaches the 80% rate it is predicted that essentially all HPV infections will be eradicated, and HPV associated cancers will be reduced to less than 20% globally (Niccolai et al., 2018). Social change through quality improvement can be directly measured in the case of HPV vaccination recommendation.

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Appendix A: WD4019: You Are the Key to HPV Cancer Prevention-2018

1. The perceived and real concerns of parents influence how clinicians recommend the HPV vaccine toward
    A. HPV, Tdap, meningitis
    B. Hep B, Tdap, meningitis
    C. HPV, Hep B, Tdap
    D. Other adolescent vaccines, pertussis, Hepatitis, HPV
2. Some parents may still be interested in vaccinating yet still have questions. Ask parents about their main concerns and use the You Call the Shots self-study modules offering responses
    A. Parental attitudes "We'll give the shots at the end of the visit. Do you have any questions for me?'
    B. Low perceived benefits "We can help prevent infection types of HPV that can cause cancers by starting the vaccine series today"
    C. Social Influences "HPV vaccination is important because it prevents cancer" & "HPV vaccine does not make your kids more likely to engage in sexual activity"
    D. Concern for adverse reactions with vaccinations "I have researched the HPV vaccine including safety. Can I share with you what I've learned?"
    E. Irregular preventative care "When you check out please make an appointment for 6 months from now."
3. HPV has been linked to cervical cancer in women and oropharyngeal cancer in women and men, in evaluating trends from the years between 2014-2019
    A. Cervical Cancer is continuing to rise, While Oropharyngeal has decreased
    B. Cervical and oropharyngeal cancers continue to rise
    C. Cervical cancers have decreased while oropharyngeal cancers continue to rise
    D. Both cervical and oropharyngeal cancers are now on the decline
4. There are concerns about safety related to vaccination. The CDC is supported by:
    A. Reactions may include ever, headaches and injection site redness and pain
    B. HPV vaccines are safe
    C. Brief fainting spells (syncope) can occur after any injection including HPV
    D. Patients should be sitting (or lying) during the injection and remain that way for 15 minutes
5. Explain the recommendations for HPV vaccine to adolescents and their parents by:
    A. Boys and girls aged 9-14 should receive HPV vaccine (series of 2) or if 15 or older (series of 3) to prevent cancer regardless of sexual activity status.
    B. Boys and girls should receive the vaccine before their 13th birthday
    C. The HPV vaccine (series of 2) should be given to all eligible adolescents age 11-12 years old, with the second dose given 6-12 months from the first
    D. Boys and girls can start the vaccine at age 9

www.cdc.gov/vaccines/ed/hpv/you-are-key-2018.html

Appendix B Literature Review Matrix

Author/Date	Theoretical/ Conceptual Framework	Research Question(s)/ Hypotheses	Methodology	Analysis & Results	Conclusions	Implications for future research	Implications for practice
Attipoe-Dorcoo, S., Singh, V., & Moodley, J. (2018).	Vaccination programme analysis	Cervical cancer leading cause of cancer related deaths in women in South Africa	News Reviews Quantitative Methods	Articles significantly described efficacious vaccine but did not mention or describe side effects	Positive and accurate media campaign in South Africa but sometimes incomplete/ Vaccine did not change sexual behavior patterns in young girls	Continued need for research on how providers may impact social acceptance	Parental consent was still applying barriers so education must continue in practice setting
Cole, T., Thomas, M. C., Straup, K., & Savage, A. (2017).	Education platform based on the Health Promotion Model to assess barriers and develop strategies to overcome	Will identifying barriers and assign strategies help to reduce the 79 million cases of HPV and prevent the 14 million new cases every year	Mixed Includes interviews, surveys on provider education and parental/patient knowledge	Results show improved vaccination rates in centers with developed education methods	Higher vaccines rate occurs when education is done, and barriers strategies are implemented	Need to continue to identify which strategies are most effective and most cost effective	Cost effective methods need to be analyzed with time required to make significant impacts
Drolet, M. (2015).	Grounded Theory	Is HERD immunity making an impact by vaccinating girls for HPV	Systematic Review and Meta-Analysis	positive	Herd immunity concepts do make statistical improvements in HPV infection	Will cancers in men be eradicated by herd immunity	Limitations exist in Herd because of dormant HPV infections causing cancers in those not vaccinated during pre-adolescent age
Fedewa, S. A., Preiss, A. J., Fisher, B. M., Goding Sauer, A., Jemal, A., Saslow, D., & Fisher-Borne, M. (2018).	American Cancer Society Goals 2026 Using HPM and Behavioral Theory	HPV vaccine prevalence to 80% of 11-13-year old's receive vaccine to reduce associated cancers	Mixed Surveys NIS for Teens and estimating numbers of pre-teens required to get to 80% goal.	Focus on cancer prevention	An additional 7.62 million males and 6.77 million females would need to receive the vaccine between 2018-2026 in order to achieve the 80% goal (p. 4720)	To reach the goal provider recommendation and parental acceptance must be increased	Education and knowledge development tools within the research need to be ongoing to reach this goal

Fisher-Borne, M., Preiss, A. J., Black, M., Roberts, K., & Saslow, D. (2018)	Primary Care Workforce developed for (FQHC's)	Vaccine project outcomes measured for effectiveness to increase HPV vaccine in FQHC	Quantitative methods measured HPV vaccine completion rates for centers in the FQHC after receiving grants to do so	Initiation rates for HPV vaccine increased significantly by 14.6 % points but were not statistically improved for the second vaccine in the series (p. S79)	Highly successful initiation project for vaccine	Other vaccines including tetanus, diphtheria and Meningococcal adherence was also improved so vaccine projects in research	QI projects are expanding for increasing HPV vaccine efforts due to the results of these programs*
Haddad, N., Allen, R. H., Szkwarko, D., Forcier, M., & Paquette, C. (2018)	Grounded Theory	Eliminating parental consent for HPV vaccine	By using Title X patient Authority	Teens can be screened to obtain OCP without parental consent (p 12)	Successful programs in schools have been demonstrated to reach >80% adherence	Comparing this vaccine to others that have different timing like in infancy improves Hep B vaccine rates	Policy changes may enable the schools to implement vaccine programs or remove parental consent for in office patient driven vaccine related knowledge
Lollier, A., Rodriquez, E., Saad-Harfouche, F., Widman, C., Mahoney, M. (2018).	HPM and behavioral care	Evaluation of high and low performing PCPs	Mixed Advisory Committee Research and provider interviews and surveys to barriers	Offices with higher rates of vaccine adherence had more full-time staff and designated clinical champions	Advisory Committee recognizes and supports the four major vaccines Tdap, meningitis, flu and HPV	Research on providers overcoming barriers in research	Implementing research in practical ways to remove bias and improve access of care required
Sussman, A., Helitzer, D., Bennett, A., Solares, A.,} Lanoue, M., & Getrich, C. (2015)	Behavioral Model Survey	Vaccination rates are still not being achieved despite strong clinical drive	Mixed, qualitative in-depth interviews with clinicians and policy makers and confirmatory surveys	Greatest barrier to vaccine was lack of tracking and health delivery challenges not sociocultural identifiers	Interventions targeting communication and education are priority to improving vaccine	In depth research has evaluated education and strategies to promote vaccine	Utilization of other venues outside of clinics must be made to reach a greater community

Appendix C: HPV Urgency Statement for Multispecialty Providers

1. **Appreciate the significance of meeting the CDC's HPV vaccination recommendation rate of 80%.** Human Papillomavirus (HPV) is the most common sexually transmitted disease in the United States in 2018 (Van Dyne et al., 2018). The Centers for Disease Control and Prevention (CDC) established the Healthy People 2020 initiative for HPV vaccination uptake of 80% in effort to effectively eliminate the HPV associated cancers. Both men and women are being diagnosed with HPV related cancers despite health care initiatives and provider awareness campaigns. With 14 million new cases per year in the United States alone, the American Cancer Society has made new a new goal for the year 2026 that would support that 80% of pre-teens 11-12 years old will receive the vaccine before their 13th birthday (Fedewa et al., 2018).

2. **Acknowledge the importance of your recommendation and considered bundling your recommendation with the other age-related school entry vaccines.** The tdap, meningitis, and flu vaccines all have adherence rates greater than 80% The World Health Organization (WHO) data demonstrates that despite vaccination efforts and screening these numbers are now globally reaching 570,000 HPV related cancers in women and 60,000 cancers in men per year (St. Laurent, Luckett, & Feldman, 2018). If vaccination rates reach the 80% goal, vaccine models suggest that the HPV infection would be completely eradicated, and cancer deaths could be reduced to 20% globally (Brisson et al., 2016).

3. **Motivate your team and include parents on the discussion around HPV vaccination as it relates to HPV related cancers.** HPV has been identified as the cause for nearly all cervical cancers, some of the vaginal cancers and most oropharyngeal cancers around the world (Senkomago et al., 2017). As HPV infection and related cancers are continuing to climb, global initiatives for surveillance and vaccination are becoming a priority (Senkomago et al., 2017). Clinicians using a thematic approach to evaluate the social impacts and barriers to HPV vaccination recommendation find that a strong recommendation from a provider is highly motivating for the parent and patient in terms of vaccination adherence (Niccolai, North, Footman, & Hausen, 2018). When addressing anti vax concerns and issues about side effects try stating "I have researched the HPV vaccine including safety. Can I share with you what I've learned?"

4. **Know your rates of recommendation and refusal so you may help develop solutions to barriers.** Locally the public commissioner of health and the CDC have reported that while nationally HPV vaccination rates among eligible adolescent patients are recorded at 40%, our state records an even lower uptake of vaccination of 30% (HPV Vaccines, 2018). The problem of HPV infection is reaching 45% of the US population and is anticipated to grow if states do not react to find vaccination compliance strategies (HPV Vaccines, 2018). The Mid-Atlantic region falls along a religious beltway in the United States that sets precedent for religious beliefs to impact vaccination adherence. The religiously exempt students make up the largest group of unvaccinated kids in the county with just under 2% claiming this exemption (Capps, 2019). The County Health Department reports that there are higher numbers of parents reporting lack of access to care related to time and travel to care centers compared to anti vaccination philosophies (Capps, 2019 para. 7). The clinics approximate current recommendation rate is 3%.

5. **Understand how to overcome barriers to HPV vaccine.** The federal initiative for public health on HPV vaccination is called the Hub and Spoke Initiative (American Academy of Pediatrics

[AAP], 2019). In a collaboration with the CDC and the AAP the *Community Guide* and the *Hub and Spoke Initiative* were formed. The priority of the Hub and Spoke Initiative is to focus on creating peer guided accountability on strong provider recommendations for vaccination against HPV (AAP, 2019). The cultural, ethical, and legal obligations to promote wellness through vaccination becomes imperative in the framework of preventing the spread of HPV infection, because infections are directly related to higher risk for cancer (AAP, 2019). With any illness that is spread due to sexual transmission a stigma and fear may present, not just in the parental community, but the provider one as well (Fedewa et al., 2018). The National Committee of Immunization and Research (NCIR) and the Advisory Committee on Immunization Practices (ACIP) have defined evidenced based guidelines for HPV vaccination that the CDC used to create the module (Health and Human Services, 2019). The CDC has a wide scope initiative for HPV vaccination and program that includes references and tools for clinicians contained in the HPV Toolkit and has an assigned approved Office of Management and Budget (OMB) # 0990-0379 (Health and Human Services, 2019). The tool includes five major item sections of content that measures learning objectives in the areas of HPV vaccine as cancer prevention, indications for the vaccines in boys and girls, components of vaccine recommendations, relevant and compelling information on the vaccine for parents, and disease prevention risks and strategies (Health and Human Services, 2019). In efforts to identify the barriers to meeting vaccination rates community leaders around the world have made poor HPV vaccination rates a global pandemic priority (Fedewa et al., 2018). Cervical cancer has trended downward in the last fifteen years, but cervical and oral cancer diagnoses continue to reach numbers larger than 500,000 per year (Senkomago et al., 2017). There is significance in HPV vaccination as a public health problem because after more than a decade of HPV vaccination awareness, providers are still coming up short with recommendations to vaccinate (Niccolai, et al., 2018). Recommendations to vaccinate have been identified as the most significant predictor of vaccination adherence among the pre-teen population (Niccolai, et al., 2018).

**This statement was developed using resources from the CDC HPV Toolkit, CE Module: WD4019: You Are The Key To HPV Cancer Prevention 2019, Health and Human Services Public Access Article (Holman et al., 2015) and the DNP Project Literature Review titled "Primary Provider Education Increasing Knowledge and Recommendation for Human Papillomavirus Vaccination "and the American Academy of Pediatrics 2019.*