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INCREASING HUMAN PAPILLOMAVIRUS VACCINATION AMONG ADOLESCENTS THROUGH PARENT TARGETED CANCER-PREVENTION EDUCATION

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INCREASING HUMAN PAPILLOMAVIRUS VACCINATION AMONG
ADOLESCENTS THROUGH PARENT TARGETED CANCER-PREVENTION
EDUCATION

A Scholarly Project Submitted to the Graduate School
in Partial Fulfillment of the Requirements
for the Degree of
Doctor of Nursing Practice

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INCREASING HUMAN PAPILLOMAVIRUS VACCINATION AMONG
ADOLESCENTS THROUGH PARENT TARGETED CANCER-PREVENTION
EDUCATION

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INCREASING HUMAN PAPILLOMAVIRUS VACCINATION AMONG ADOLESCENTS THROUGH PARENT TARGETED CANCER-PREVENTION EDUCATION

An Abstract of the Scholarly Project by
Shannon Leigh Duncan

The purpose of this study was to determine if parent targeted HPV education emphasizing the cancer-prevention benefits of vaccination increased initiation of the Gardasil 9 series among adolescents attending Pittsburg Community Middle School (PCMS). This project was completed in conjunction with the Southeast Kansas Community Health Center (SEK CHC) and consisted of providing HPV and Gardasil 9 education to the parents/legal guardians of the students enrolled at PCMS one week prior and during the 2018 parent-teacher conference sessions. An informational mailer was sent out to all parents/legal guardians of the PCMS students and live one-on-one educational encounters were provided to those who attended one of the conference sessions. An opt-out survey was issued to willing parent/legal guardian participants to aid in determining barriers against HPV vaccination. Data was collected from the SEK CHC KidCare school health van's electronic medical records to compare initiation of the Gardasil 9 series from October 25th-November 29th, 2017, when no education was provided, versus October 25th-November 29th, 2018, six weeks after the parent-teacher conference educational intervention. An increase in Gardasil 9 initiation was noted in the six weeks post-education in 2018 when compared to the same time frame in 2017. The results of this study indicate HPV education focusing on cancer prevention have a positive effect on obtaining parent/legal guardian consent for HPV vaccination.

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Chapter I

Introduction

Human Papillomavirus, often referred to as HPV, is a sexually transmitted infection (STI) that affects approximately 76 million people in the United States, making it the most common STI in America (Farmer et al., 2016). Of the millions infected with this virus, it is estimated that 33,000 of these cases will result in either cervical, vulvar, anal, oropharyngeal, or penile cancers per year (Farmer et al., 2016). The incidence for HPV related-cancers is as follows: 96%-99% of cervical cancers, 90%-93% of anal cancers, 12%-63% of oropharyngeal cancers, 36%-40% of penile cancers, 40% of vaginal cancers, and 40%-51% of vulvar cancers (Thomas, 2016). The annual cost of managing HPV infection and the cancers that result in both males and females is \$252 million (Thomas, 2016).

Description of the Problem

Human Papillomavirus is a self-initiating virus that attacks when it encounters a cellular surface and within 24 hours of contact has incorporated its own DNA into the basal cells' nuclear DNA (Thomas, 2016). Once the viral genetic material has undergone cellular replication, proteins are produced that further advance the infection (Thomas, 2016). These proteins allow the HPV viral cells to form two different layers that promote binding to basal cells in areas such as the base of the tongue, oropharynx, and cervix

(Thomas, 2016). The probability these cellular changes will result in precancerous and cancerous lesions is related to the persistence and type of infection (Castle & Maza, 2015). In adolescent and young women, there are areas of the cervix that undergo rapid cellular changes, making them a host to HPV cells (Ratanasiripong, 2014). Exposure to HPV during this time frame, especially for females, significantly increases the risk of HPV infection (Ratanasiripong, 2014). Vulnerability to HPV is greater when vaccination occurs after potential exposure (Castle & Maza, 2015). If the Gardasil 9 series is provided at a younger age, there is a higher probability repeated encounters with various HPV strains should not result in cellular mutations that lead to the formation of cancerous lesions. There are multiple strains of HPV but 70% of the cancers that result from this infection are caused by two types, HPV-16 and HPV-18 (Castle & Maza, 2015).

In 2006, the Food and Drug Administration (FDA) approved the use of Gardasil, a prophylactic quadrivalent vaccination protecting against HPV strains 6, 11, 16, and 18 (Castle & Maza, 2015). In 2007, the Centers for Disease Control (CDC) and Advisory Committee for Immunization Practices (ACIP) recommended the routine use of a 3-shot series with quadrivalent Gardasil as the primary prevention of HPV infection in women 9-26 years old (Castle & Maza). Two years later, in 2009, the CDC and ACIP amended its previous recommendation to include males between 11 to 26 years old (Thomas, 2016). In February 2015, Gardasil 9 (a 9-valent vaccine protecting against strains 6, 11, 16, 18, 31, 33, 45, 52, & 58) became FDA approved with a 97% efficacy rate in protecting against infections and resultant HPV-related cancers, replacing the quadrivalent Gardasil (Thomas, 2016). Current CDC and ACIP guidelines recommend Gardasil 9 vaccination for males 9 to 15 and females 9 to 26 (Thomas, 2016). Because

HPV is sexually transmitted, the 20 to 24 year old age group is at the highest risk for exposure and infection (Ratanasiripong, 2014). Therefore, those receiving the greatest benefit from Gardasil 9 are the individuals that have yet to be exposed, specifically adolescents between 11 and 14 years old (Castle & Maza, 2015).

Unfortunately, despite the insistence by the CDC and ACIP to vaccinate, less than 21% of males and 60% of females in the United States have received the recommended vaccination series (Thomas, 2016). This lack of uptake has led to 79 million people currently infected and 14 million newly diagnosed cases each year (Farrar et al., 2016).

Although the statistics mentioned above refer to the age span eligible for the vaccine, the numbers specifically reflecting young adolescents (11 to 14) are just as unsettling, especially in the state of Kansas. According to the CDC, only 50-59% of 11 to 14 year-old Kansas residents have received one or more of the Gardasil 9 series, and the vaccination rate for HPV in Crawford County is staggeringly less at 10% (CDC, 2017).

Parents of early adolescents are often naïve to their child's eventual sexual activity and therefore, their exposure to STIs, such as HPV (VanWormer, et. al, 2017). It is important providers emphasize education about HPV vaccination to parents focusing on its efficacy and safety to prevent prevalent cancers and not solely on current or eventual sexual behaviors. Even though HPV is a sexually transmitted infection, the vaccination does not contribute to the act of sexual intercourse in any way (Ratanasiripong, 2014). It simply prevents infection from further advancing into precancerous, cancerous, or malignant disease.

Significance to Nursing

Practitioner guidance when it comes to vaccine guidelines and schedules is an important source of education for parents. During adolescence, important recommended vaccines include Hepatitis A, Hepatitis B, meningococcal, and tetanus, diphtheria, and acellular pertussis (Tdap), and several of these are offered through the public-school system (Castle & Maza, 2015). There is no contraindication to administration of the HPV vaccine with the other vaccinations recommended for this age group (Castle & Maza, 2015). Therefore, there is no reason primary care providers (PCPs) shouldn't strongly recommend HPV vaccination be included in this series.

In rural communities like Crawford County, parents' knowledge of HPV and its link to cancer is very minimal (Thomas, 2016). When primary care providers are appropriately educated on Gardasil 9 and its recommended use, the education gap present in the parent population can be bridged. However, lack of education is not the only barrier to increasing rural vaccination rates. Additionally, the perception of HPV and its relation to sexual activity and/or behaviors may have a negative effect on vaccination consent. The cancer-causing abilities of HPV need to be the primary focus of parent education, not the method of transmission. An increase in education of HPV-related cancers is a responsibility of providers if attitudes toward the Gardasil series are going to change.

Purpose

The aim of this scholarly project is to improve HPV vaccination uptake among the Pittsburg Community Middle School (PCMS) student body. The overall goal of this project is to implement an educational intervention designed to increase parental consent for HPV vaccination. The purpose of this evidence-based research project is to 1)

increase HPV vaccination uptake in 11 to 14 year old adolescents in the student body of PCMS; 2) provide parent education on HPV vaccination that focuses on cancer prevention; 3) change perception of Gardasil 9 from prevention of a STI to cancer prevention. It is crucial to break the association of vaccinating against HPV to sexual activity and redirect the focus toward prevention of an aggressive cancer-causing virus.

Conceptual Framework

The conceptual framework chosen for this project is the Vaccine Perceptions, Accountability, and Adherence Model. This model was developed by Dr. Ingrid T. Kratz of Brigham and Women's Hospital, Dr. Norma C. Ware of Harvard Medical School, Dr. Glenda Gray of the University of Witwatersrand, Dr. Jessica E. Haberer of Harvard Medical School, Dr. Claude A. Mellins of New York State Psychiatric Unit and Columbia University, and Dr. David R. Bangsberg of Harvard Medical School in 2010 as a means to better understand HPV vaccine adherence, completion, and efficacy among adolescents (Katz, et al., 2010). The developers of this model took into account various factors affecting vaccine acceptance and the potential barriers that contribute to completion of the series among both adolescents and parents/caregivers (Katz, et al, 2010).

The following diagram (Figure 1) shows The Vaccine Perceptions, Accountability, and Adherence Model. It depicts multiple sociocultural factors at various stages of the vaccination series that often act as barriers for vaccine denial or neglect of completion (Katz, et al., 2010). The application of this model is intended to assist research targeted to better understand the obstacles that stand in the way of HPV vaccine education, uptake, and adherence (Katz, et al., 2010).

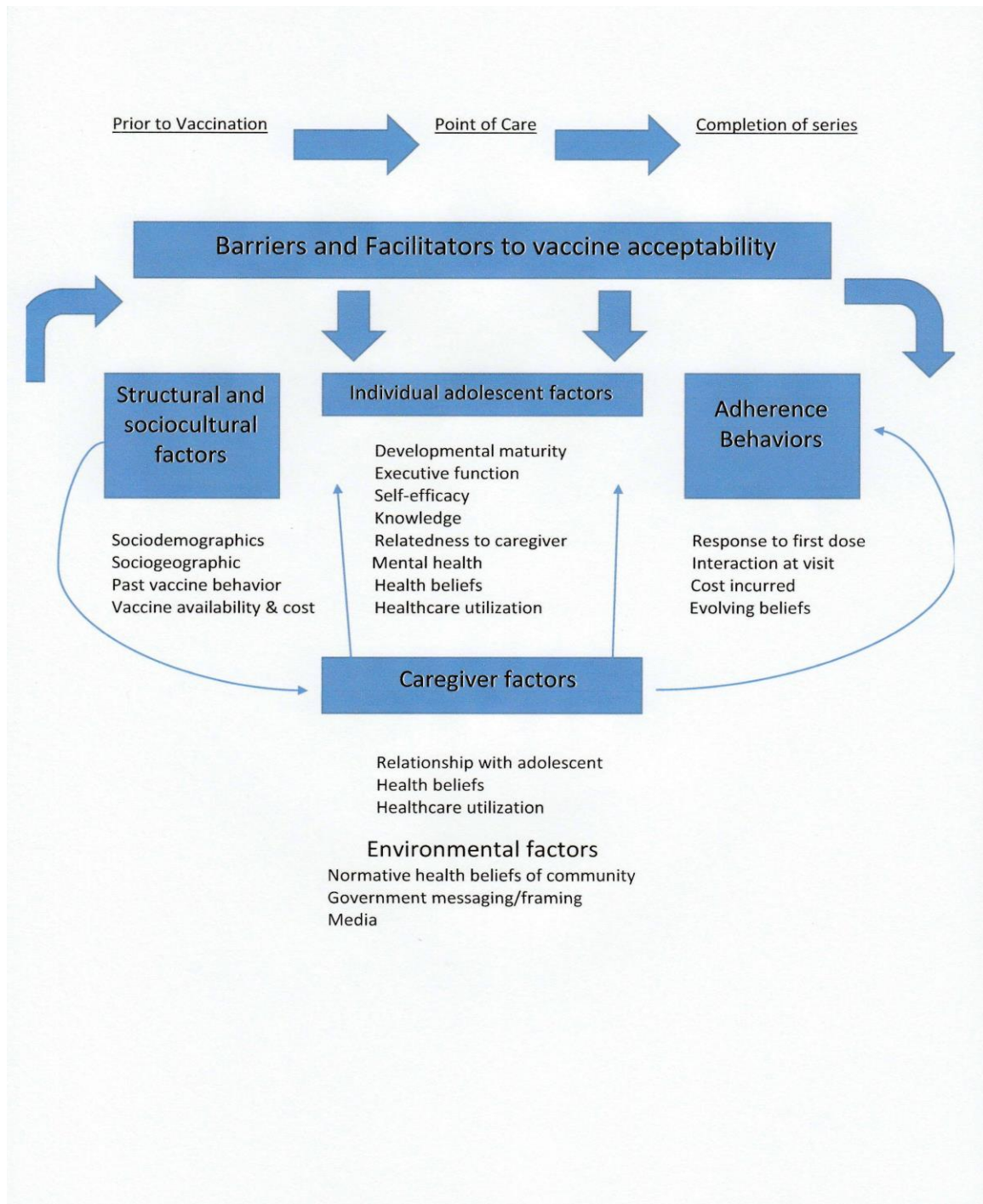


Fig. 1 The vaccine perceptions, accountability, and adherence model. Adapted from “Scaling Up Human Papillomavirus Vaccination: A Conceptual Framework of Vaccine Adherence” by Katz, I.T., Ware, N.C., Gray, G., Haberer, J.E., Mellins, C.A., & Bangsberg, D. R., 2010, *Sexual Health*, 7(3), 279-286.

Research Questions

1. What are the perceived barriers to HPV vaccination of adolescent parents/legal guardians in a rural southeast Kansas school district who opt-out of HPV vaccination for their child and attended parent-teacher conferences?
2. Will education focusing on cancer prevention increase parental consent to vaccinate against HPV in 11 to 14 year olds among the parents/legal guardians that received the mailer and those who received the mailer, as well as attended parent-teacher conferences in 2018?
3. Will the Southeast Kansas Community Health Center KidCare school health van see an increase in vaccination among 11 to 14 year olds six weeks post education in children whose parents/legal guardians received the mailer and those that received the mailer and one-on-one education at parent-teacher conferences vs the 2017 fall semester when no education was provided?

Definition of Key Terms

The following terms will be seen frequently by the reader throughout this paper. For better understanding, the definitions are provided here. The terms and definitions include: adolescents, cancer, Center for Disease Control (CDC), Gardasil 9, human papillomavirus, Pittsburg Community Middle School, primary care provider, sexually transmitted infection, Southeast Kansas Community Health Center, uptake, vaccine.

Adolescent- growing into manhood or womanhood (Adolescent, 2018)

Cancer- a term for diseases in which abnormal cell growth occurs and can invade nearby tissues or spread to other parts of the body (NCI Dictionary of Cancer Terms, 2018)

Center for Disease Control (CDC)- major operating component of the Department of Health and Human Resources that works to protect America from health, safety, and security threats, both foreign and in the U.S. (CDC Organization, 2018)

Gardasil 9- a vaccine used to prevent anal, cervical, vulvar, vaginal, penile, and oropharyngeal cancers caused by nine different strains of human papilloma virus (NCI Dictionary of Cancer Terms, 2018)

Human papillomavirus- a sexually transmitted type of virus that can cause abnormal tissue growth and other changes to cells that, over time, can develop into cancer (NCI Dictionary of Cancer Terms, 2018)

Pittsburg Community Middle School (PCMS)- Public school in the USD 250 school district in Pittsburg, KS for grades 6, 7, & 8

Primary care provider- individual that assess, manages, and treats individuals with acute and chronic medical conditions; physicians, physician's assistant, or nurse practitioner (Primary Care Provider, 2018)

Sexually transmitted infection- bacteria, viruses, or parasites known to be transmitted through sexual contact whether it be vaginal, anal, or oral (Sexual and reproductive health, 2018)

Southeast Kansas Community Health Center- a Federally Qualified Health Center dedicated to providing quality health care to everyone regardless of income or insurance status with twelve clinic sites in Crawford, Cherokee, Labette, Montgomery and Allen counties (Community Health Center of Southeast Kansas, 2018).

Uptake- an act or instance of taking up or adopting (Uptake, 2018)

Vaccine- a biological preparation that improves immunity to a particular disease (Vaccines and Immunizations, 2018)

Logic Model

The following diagram (Figure 2) is a logic model that depicts the identification of HPV vaccination barriers, development of educational resource to overcome barriers, and expected outcomes of increased HPV education. The Southeast Kansas Community Health Center and its traveling school nurse van, USD 250 superintendent, Pittsburg Community Middle School administrative staff and school act as key stakeholders in the input stage of this project. Assessment of HPV vaccination uptake and adherence among these stakeholders provide needed information to organize and develop an educational resource that correlates HPV vaccination with cancer prevention. Participation and implementation by the SEK Community Health Center and their school nurse mobile clinic (KidCare van) will, ideally, lead to the outcomes depicted.

The outcomes portion of this model have been divided into three time frames, short, medium (intermediate), and long term outcomes. The most immediate responses predicted from the educational intervention include a change in perception of HPV vaccination and an increase in 11 to 14 year olds vaccinated. With continuation of education focused on cancer prevention, it is anticipated attitudes toward the Gardasil-9 series will shift away from the fact that HPV is sexually transmitted. In addition, it is the hope of the researcher that with increased awareness parents will begin to initiate discussion of HPV vaccination and adolescents will become vaccinated prior to HPV exposure. The ultimate long-term outcomes will be to reach the Healthy People 2020

goal of 80% vaccination rate and an overall reduction in the incidence of HPV-related cancers in Crawford County.

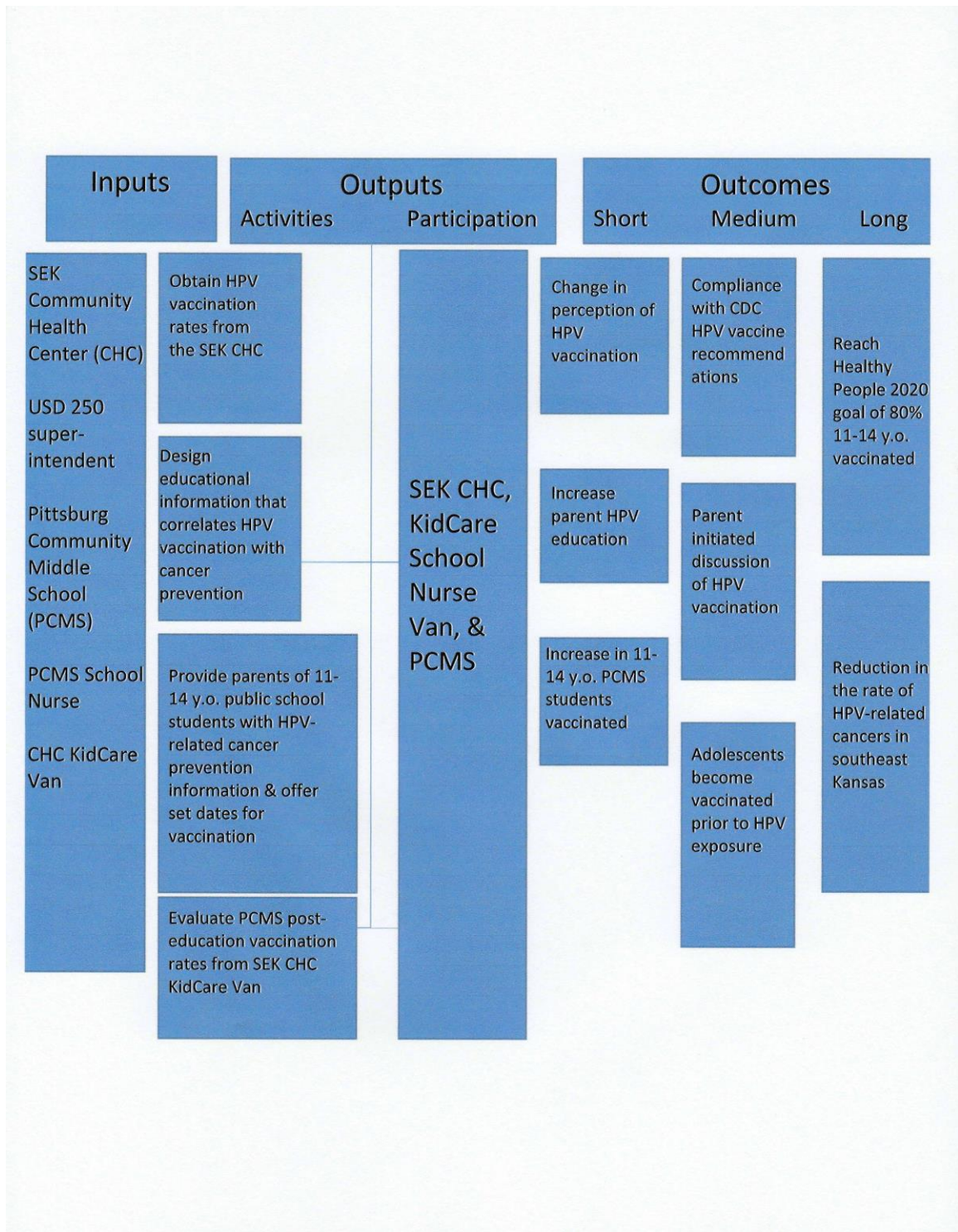


Fig. 2 HPV Vaccine Adherence Logic Model

Summary

Even though vaccination is one of the most common health-promoting behaviors patients and practitioners participate in, HPV vaccination has yet to be considered a routine vaccine in the way that Hepatitis B and Meningococcal vaccines are (Thomas, 2016). The question remains: for what reasons are HPV vaccination rates still so low nationally, statewide, and locally? There is abundant knowledge on how and why HPV vaccination works to prevent multiple cancers in men and women. However, to get the maximum vaccination effect against HPV, it is necessary to undergo the Gardasil 9 series before potential exposure to the virus occurs. The vaccine's cancer-preventing benefits are greatest at this time, so increasing HPV vaccination rates among young adolescents may eventually decrease the incidence of HPV-related cancers. In an effort to increase vaccination rates, the HPV vaccine needs to be associated with cancer prevention and not sexual activity or behaviors by providers, patients, and their parents/legal guardians.

Chapter II

Literature Review

The attempt to determine a reason behind the low uptake of the Human Papillomavirus (HPV) vaccine, specifically in the rural setting, requires a review of literature to examine similarities, differences, and patterns of behaviors among providers and adolescent patients and their parents. This literature review was conducted using the online databases CINAHL and PubMed. All articles were obtained from peer-reviewed journals using the keywords: Human Papillomavirus, HPV, vaccination rates, Gardasil, safety, rural, and vaccine uptake. A significant amount of research has been conducted on HPV vaccination rates and the reasoning behind low uptake. Using the keywords above, 26 articles met the criteria for review. The criteria required for the articles selected for review were as follows: published in the last five years, primary study, adolescent and young adult study population, and provider/patient barrier analysis. The CDC website was utilized to determine current statistics regarding HPV vaccination rates nationally and locally. The ACIP Guidelines were also reviewed in relation to the recommended practices of HPV vaccine administration. This review highlights some of the barriers identified and intervention proposed and implemented to overcome low vaccine uptake.

Rural Vaccination Rates

Rural vaccination rates for patients of all ages has been extensively studied. Data was collected from both adolescents' parents and young adult/college-age individuals eligible to receive HPV vaccination to attempt to determine the reasoning behind poor vaccine uptake in rural communities (Lai, Ding, Bodson, Warner, & Kepka, 2016; Crosby, Casey, Vanderpool, Collins, & Moore, 2011). Results established parents older than 45-years-old were less likely to consent to vaccination when compared with parents 35 and younger (Lai et al., 2016). The parents of 17 year old study participants were also more likely to initiate and complete the series than those of the 13 year olds (Lai et al., 2016). Vaccine compliance during infancy and childhood was associated with greater compliance (Lai et al., 2016). Study participants that were up-to-date with immunization had higher prevalence of HPV vaccine initiation and completion (Lai et al., 2016).

Another possible barrier to vaccination is the personal cost of vaccination. In a rural Kentucky study, college-aged women (18 to 26) and were given a Women's Health Questionnaire followed by a voucher to receive Gardasil 9 for free, therefore eliminating any cost component restrictions (Crosby et al., 2011). Despite the offer of free vaccination, rural women were seven times less likely to complete the vaccine series than their urban counterparts eliminating financial hardship as a barrier (Crosby et al., 2011). Therefore, it is difficult to determine which variables are most responsible for lack of vaccine follow-through by rural adolescent parents and young adult women.

Parental Barriers

Ultimately, parent consent is needed before HPV vaccination can be administered, especially in the target age group of 11 to 14, but how to obtain consent remains a very

important and unanswered question. Between 2009-2014, 52.1 % of adolescents (mean age of 11.2 years) received tetanus-diphtheria-acellular pertussis (Tdap), 45.8% received from meningococcal (MenACWY), and only 18.4% were vaccinated for HPV (Vielot, Butler, Brookhart, Becker-Dreps, & Smith, 2017). Several of the studies selected for this review identified parental lack of HPV knowledge and lack of provider recommendation as the two main barriers in vaccinating for HPV (Vielot et al., 2017; Brown, Gobra, & Pellman, 2017; VanWormer, et al., 2017; Cates, Shafer, Diehl, & Deal, 2011). A California pediatric clinic began surveying parents in January 2015 to determine their reasoning behind agreeing or refusing to vaccinate for HPV (Brown, Gobra, & Pellman, 2017). Researchers found strength of provider recommendation to be the most common reason for consenting to vaccinate (84.1%) and information availability as the second most common reason accounting for 63.4% of parents surveyed (Brown, Gobra, & Pellman, 2017). Similar results were found in a survey-based study done at a Wisconsin clinic, where parents' preconceived attitudes toward HPV were assessed and education was tailored to address primary concerns, which mostly consisted of vaccine effectiveness and safety (VanWormer, et al., 2017). This resulted in 60% of adolescent patients receiving a second dose and 38% completing the three-shot series (VanWormer, et al., 2017).

Social marketing has also been shown to assist in increasing HPV vaccination rates. In North Carolina, a social marketing campaign was deployed in four medically underserved, rural counties from June 2009-November 2009 (Cates, Shafer, Diehl, & Deal, 2011). The campaign included placing educational materials and reference information focusing on the HPV vaccine's cancer-preventing benefits, in physicians'

offices and settings where mothers of the target age group (9 to 13) frequented (Cates, Shafer, Diehl, & Deal, 2011). Data analysis revealed a 2% increase in HPV vaccination rates in the selected counties versus non-intervention counties (Cates, Shafer, Diehl, & Deal, 2011). Although this isn't a vast improvement, the social marketing campaign solidifies the hypotheses that increased education and availability of resources has a positive effect on improving HPV vaccination rates.

Misconceptions on Sexual Behavior

Lack of knowledge regarding HPV vaccination has led to parental misconception on the after-effects of vaccine administration (Ratanasiripong, 2014). One of the main misconceptions about the vaccine is that it has an effect on post-vaccine sexual behaviors (Ratanasiripong, 2014). Multiple factors have been used to define "sexual behavior".

The defining characteristics for measuring vaccination effects on sexual behavior consist of age at initiation of intercourse, number of sexual partners, and consistent use of condoms and other safe sex practices (Ratanasiripong, 2014).

The correlation of vaccination for HPV and sexual behavior in both the young adult and young female population is complex. Sexual behaviors in the age group in which initial vaccination is recommended has not been thoroughly studied but has been evaluated among the older adolescent and young adult age groups (Mullins, Widdice, Rosenthal, Zimet, & Kahn, 2015). Since exposure increases with age, young adolescents are expected to have the greatest benefit from the HPV vaccine because, in most cases, they have yet to be exposed to the virus (Castle & Maza, 2015). In a 2015 study, sexual attitudes and perceptions were evaluated among 11 to 12 year old girls, their mothers and clinicians. Even though multiple sources of data were included in this study, findings

indicated that HPV vaccination was unlikely to affect girls' sexual behavior and attitudes (Mullins, Widdice, Rosenthal, Zimet, & Kahn, 2015). As knowledge about HPV, the cancerous effects of the virus, and the vaccine increased, risk sensitivity of HPV became more accurate, with several subjects reporting that HPV and vaccine knowledge correlated with safer sexual attitudes (Mullins, Widdice, Rosenthal, Zimet, & Kahn, 2015). It is also worth noting the participants with the greatest knowledge of HPV prior to the vaccination remained sexually inactive throughout the 30 month study (Mullins, Widdice, Rosenthal, Zimet, & Kahn, 2015). Hansen, et al. (2014) performed a retrospective cross-sectional survey of approximately 44,000 women, 3,805 having received vaccination against HPV. The survey results showed HPV vaccination was not associated with initiation of sexual intercourse at a younger age (Hansen, et al., 2014). Additionally, data showed the number of sexual partners was not significantly higher in vaccinated women vs. unvaccinated women and contraception use was more consistent among the vaccinated participants (Hansen, et al., 2014). Population size varied from less than one hundred to just over 100,000 across the studies. Essentially, all of the studies reviewed drew the same conclusion that HPV vaccination did not promote or enhance sexual promiscuity. However, because of the varying population sizes, multiple age groups, and convenience sampling in selection of the participants, there is still a lack of generalizability among the results.

Safety & Efficacy

Informed consent is necessary to obtain parental permission to vaccinate against HPV, therefore providers must be well versed in discussing the safety and efficacy of vaccinating with Gardasil 9. As with any vaccine administered to children, parental

concerns of adverse health effects that may result from vaccination effects uptake impact (Zimet, Rosbeger, Fisher, Perez & Stupiansky, 2013). Adverse effects associated with Gardasil 9 have been thoroughly studied to determine if the benefits of vaccination outweigh the risks.

The most commonly described injection-site adverse effects from receiving either one or both shots in the Gardasil 9 series are: pain at injection site, swelling, erythema, pruritus and hematoma (Garland, et al., 2015; Zimet, Rosberger, Fisher, Perez, & Stupiansky, 2013). In a study population of 618 subjects, mild to moderate injection-site symptoms were the most frequently reported adverse reaction (Garland, et al., 2015). Out of that same study population, 7.6% experienced severe injection-site swelling and 3.3% experienced severe injection-site swelling and erythema (Garland, et al., 2015). Only one test subject had a severe enough injection-site reaction with the first shot in the series that they did not receive the second shot (Garland, et al., 2015). Vaccine-related systemic adverse effects were also evaluated in this study. Systemic reactions reported were headache, pyrexia, nausea, and dizziness with a less than 2% incidence among participants (Garland, et al., 2015). Only one test subject in the 2015 study experienced a severe systemic response with the initial Gardasil 9 shot (Garland, et al., 2015). This subject was diagnosed with tonsillitis that required surgical incision and drainage of the tonsils (Garland, et al., 2015). The patient was treated with antibiotics and fully recovered with no further residual effects (Garland, et al., 2015). No fatalities as a result of HPV vaccination occurred in any of the studies included in this literature review (Garland, et al., 2015; Petersen, et al., 2017; Schilling, et al., 2015; & Zimet, Rosberger, Fisher, Perez, & Stupiansky, 2013). Additionally, reported adverse effects occurring

after vaccination does not necessarily mean they were a result from the vaccine (Zimet, Rosberger, Fisher, Perez, & Stupiansky, 2013).

In addition to studying the safety of the Gardasil 9 vaccine, its efficacy has been thoroughly evaluated as well. The Gardasil vaccine is 9-valent, meaning it protects against 9 different categories of the HPV virus (6, 11, 16, 18, 31, 33, 45, 52, 58) (Petersen et al., 2017). Administration of the series initiates a powerful immune system response to all 9 strains in study participants of all ages, races, and geographic backgrounds (Petersen et al., 2017). Blood testing for immunization effectiveness has been performed on a variety of age groups of both genders with results suggesting that stronger immunity to all 9 HPV strains occurs in young adolescents who have not yet been exposed to HPV (Petersen et al., 2017). Because the optimal age for HPV vaccination is the same age the Tdap booster and meningococcal vaccine are required, Gardasil 9 efficacy with co-administration of these vaccines has also been evaluated. Schilling, et al. (2015) showed the immune response when all 3 vaccines were administered together was just as adequate as when they were given one month apart. The ability to administer all 3 vaccines at the same visit is beneficial in creating greater vaccine compliance (Schilling, et al., 2015).

Cancer Screening Impact

Although not enough time has elapsed since Gardasil 9's introduction to determine an accurate effect on the incidence of cervical cancer, studies have been performed world-wide on how HPV vaccination has impacted cervical cancer screening and the rate of cervical lesion detection. In countries such as Australia, that have implemented a national and publically funded HPV vaccination program, the vaccinated

female population is more likely to be compliant with cervical cancer screening guidelines (Canfell, et al., 2017). A study completed in the UK showed an increase in routine cervical cancer screening among the mothers who consented for vaccination of their adolescent daughters (Spencer et al., 2015). Munro et al. (2017) looked at the incidence of HPV strains found on colposcopy in a group of women that were offered the vaccine through a “catch-up” vaccine program. The sample population consisted of 361 women aged 20 to 25 years who had been referred for colposcopy due to abnormal cytology results (Munro, et al., 2017). The HPV 16 strain was found on colposcopy specimen in 8.6% of the vaccinated group and 46.7% of the unvaccinated group, showing the effectiveness of HPV vaccination (Munro, et al., 2017). A similar study done in Denmark researched the incidence of cervical lesions in women who had received the vaccine during adolescence (Baldur-Felskov, Dehlendorff, Junge, Munk, & Kjaer, 2014). Using the female population prior to Denmark’s vaccination program (2000-2010) as a control group, researchers found the incidence of cervical lesions was increased among all age groups prior to 2010 (Baldur-Felskov, Dehlendorff, Junge, Munk, & Kjaer, 2014). The most statistically significant decrease in cervical lesions was seen in the population with high HPV vaccine uptake after the initiation of the vaccination program in 2010 (Baldur-Felskov, Dehlendorff, Junge, Munk, & Kjaer, 2014).

Provider Intervention

Parent and patient barriers are not the only factor to consider in the lack of HPV vaccine uptake. Provider vaccination practices must also be considered in the research of low HPV vaccine uptake. A user-centered design approach was conducted at the Kaiser Permanente Center in Portland, Oregon. Researchers conducted interviews with six

primary care providers, five subject matter experts (two clinician performance consultants, a clinical program coordinator, a social marketing and health communications consultant, and a PhD-level researcher specializing in vaccine compliance research), and three industry representatives (a middle school guidance counselor, a marijuana legislation activist, and a retail curriculum expert) on knowledge, attitudes, and belief of HPV vaccination and potential perceived barriers to recommendation of the vaccine (Henninger, et al., 2017). The data from the interviews was synthesized and a 4-hour workshop was attended by the interview participants as well as other stakeholders, such as parents of adolescents, with the intention of intervention development to be utilized in the clinic (Henninger, et al., 2017). From this workshop, it was determined that interventions to be implemented to improve communication and administration of the HPV vaccine must focus on: enhancing trust, rapport, and communication, enhancing clinician knowledge of parental concerns, design of topic approach, and increasing clinicians' comfort with discussing difficult topics (Henninger, et al., 2017). Five potential interventions were proposed using the themes identified in the workshop to increase effectiveness of clinician communication with parents and adolescents about HPV vaccination (Henninger, et al., 2017). Researchers concluded the user-centered design approach is an effective and efficient tool for developing interventions to improve HPV vaccination rates within the clinical setting (Henninger, et al., 2017). However, none of these proposed interventions were implemented and studied for effectiveness. In a different study, interventions focused on provider/staff education of HPV vaccination and clinic practices on vaccine reminder notifications (McLean, et al., 2017). The study took place between February 2015 and

March 2016 and showed an increase in HPV vaccination from 41% to 59% among adolescents aged 11-12 years in the intervention clinics (McLean, et al., 2017). In the control clinics, vaccination rates increased as well, but were less significant improving from 32% to only 45% (McLean, et al., 2017). Results of this study show the impact of proper provider/staff education and patient reminder/recall on HPV vaccination rates.

Summary

The prevalence of HPV and the cancers that result from the infection pose a significant public health issue. Reduction of the cost to manage and treat HPV-related STIs and the various cancers that may result from the virus is a public policy issue that should be considered by primary care providers as well. Primary providers must be thoroughly educated so that accurate and appropriate information about the cancer preventing benefits of HPV vaccination are provided to the vaccine's target populations so that those patients may make a correctly informed decision.

The articles referenced in this literature review provide a great deal of information from a variety of perspectives to enlighten health care providers the perceived barriers to consenting to HPV vaccination. Populations and settings of the various studies reduces generalizability of the data but the similarities found in the results are a strong testament to their validity. Barriers and interventions revealed throughout this review provide a solid foundation for this scholarly project.

Chapter III

Methodology

The project design and target population were selected after analysis of the CDC's and ACIP's recommendations of Human Papillomavirus (HPV) vaccination among adolescents, as well as a review of literature about the benefits of vaccinating this age group with Gardasil 9. The target population for this study was chosen because the 11 to 14 year old age group is believed to have the greatest long-term benefits from vaccination. Human Papillomavirus exposure, especially repeated encounters, is proven to be associated with development of cervical, vaginal, vulvar, penile, anal, and oropharyngeal cancers. The focus of this research is to provide education that correlates HPV vaccination with cancer prevention, therefore increasing the vaccination rate of 11 to 14 year olds attending PCMS in Pittsburg, KS. Immunizations are offered on-site by the SEK CHC traveling school health van (KidCare van). This chapter will discuss the methodology implemented to perform this study.

Project Design

This quasi-experimental study utilized an educational intervention for parents of PCMS students emphasizing cancer prevention as the purpose behind vaccinating against HPV with the 9-valent Gardasil vaccine. Data collected was quantitative in nature and was collected using the CHC's KidCare van vaccine tracking database. Vaccination rates

were collected from the database in the six week period after education was administered and was then compared to vaccination rates from the same six week period during the prior year to determine if increased parental knowledge of cancer prevention benefits initiated an increase in parental/legal guardian consent for vaccination against HPV.

Sample

Target Population

Upon approval from SEK CHC, PCMS, and Pittsburg State University, parent/legal guardian education was presented during parent/teacher conferences on October 16th, 17th, and 19th, 2018 at the PCMS campus. The target population for this study consisted of parents/legal guardians of 11 to 14 year olds attending PCMS that have yet to consent for their child to receive HPV vaccination. Recruitment consisted of an educational mailer notifying parents of the CHC's presence and direct one-on-one encounters during conference times. Inclusion criteria for this study consisted of parents/legal guardians who have not yet consented to HPV vaccination for their child. Those who have either initiated and/or completed the Gardasil 9 series were not targeted for the educational intervention and statistical data only reflected those that have consented to begin the vaccination series. Those who receive the second Gardasil 9 injection (to complete the series) during the six week post-education period were excluded from this study's data collection.

Protection of Human Subjects

All interactions with subjects remained anonymous. No personal information was obtained from parents participating in the educational intervention. The vaccination data collected did not include any personal identifiers. Data collection occurred after the

proper institutional review process (IRB) at Pittsburg State University and the Irene Ransom Bradley School of Nursing had been completed and final approval was given. Data was then divided by age group and gender and entered in to a spreadsheet but no other identifiable information was collected throughout this study. All data collection was conducted with the KidCare van's electronic records. Records or databases utilized by PCMS will not be a source of data for this research. Adherence to criteria for including human subjects set forth by Pittsburg State University and SEK CHC were upheld throughout the research process by the researcher.

Instruments

To enhance the educational intervention additional resources will be utilized. The local chapter of the American Cancer Society has produced two public service announcements (PSAs) on the importance of HPV vaccination, featuring two local physicians. One or both of these videos were playing on a loop during the conference times. The CHC has been granted unlimited access to both of these PSAs to use at their discretion to improve local HPV vaccination rates. The collaboration of the researcher with the CHC allowed the PSAs to be incorporated into the study's educational intervention.

An HPV educational mailer (Appendix B) was mailed in bulk to all parents of students enrolled at PCMS one week prior to parent-teacher conferences and the same mailer was available throughout conference times. This mailer included a letter to parents informing them of the CHC and researcher's presence during parent/teacher conferences and their availability to provide additional information and answer questions. The mailer also included the KidCare van schedule for PCMS, how the vaccine is

administered, and the process for follow-up to ensure the series is completed with the second injection. At the end of the mailer, reliable and research based websites (i.e. www.cdc.gov, www.cancer.gov, www.chcsek.org) were provided as avenues for further education. Additionally, the CHC KidCare van Consent to Vaccinate form was included. Lastly, a CDC parent information sheet completed the mailer. The PDF was retrieved from the CDC's website and provided an overview of HPV and its cancer-causing potential.

A cross-sectional questionnaire survey on resistance to vaccination (Appendix A) was administered to those parents/legal guardians recruited during parent-teacher conferences to provide insight to parental barriers against HPV vaccination. The survey inquired about lack of education, lack of provider recommendation, religious beliefs, and age of child as potential reasons behind refusing the Gardasil vaccine. This tool was implemented to enhance the validity of the study's results and future attempts at educating on HPV vaccination to directly target parental reservations to vaccinate. Implied consent was assumed with completion and return of the survey.

Procedure

Assistance and cooperation from multiple parties was necessary to design this study and remained essential until its completion. Contact was made with Dawn McNay at the CHC to discuss project details and obtain permission to collaborate with this researcher's study, to be performed in conjunction with steps the CHC was taking to fulfill requirements of their Innovation immunization grant. Since no patient-specific information was necessary for data collection in this study, no legal/signed agreement was required by the CHC, other than the standard HIPPA and confidentiality forms.

The study idea was then presented to the superintendent of the school district. At this meeting, permission was granted to proceed with HPV education during parent-teacher conferences as a public health initiative. Again, because no personal parent and/or student information was collected, a legal agreement between the researcher and the school district is not a requirement. According to the superintendent, the researcher's involvement is encompassed under the existing legal agreement between the school district and the CHC. HPV vaccine protocol and procedure was then discussed with the PCMS principal and on-campus school nurse. The parent-teacher conference process was discussed with the school principal to determine the optimal location for parent traffic during conferences and the potential population sample size.

One week prior to parent-teacher conferences, the HPV educational mailer was mailed to all parents/legal guardians of students enrolled at PCMS by the school district's head office. The educational presentation took place on October 16th and 17th, 2018 from 3:30pm-7:00pm and October 19th, 2018 from 8:00am-12:00pm. As parents checked-in for conferences, researchers inquired about HPV vaccination for their children. For parents who refused vaccination, they were asked to complete an opt-out survey. The parents who had not yet authorized HPV vaccination were asked to watch the short PSA video available and the researcher provided them with CDC and American Cancer Society HPV educational handouts. The contents of the educational mailer were reviewed with the parents/legal guardians and any questions were addressed. Parents/legal guardians were then be encouraged to either submit consent to vaccinate immediately or complete the opt-out survey.

At the completion of the three conference sessions, synthesis and analysis of survey data and opt-out forms was performed. The CHC KidCare van vaccination electronic records databases were accessed and HPV vaccination rates from October 25th, 2017 thru November 30th, 2017 were collected to determine vaccination rates when no HPV education was provided. The CHC databases were accessed again six weeks post-education (after November 30th, 2018) to evaluate current HPV vaccination rates. Data collected included age, race and gender of those receiving the initial injection of the Gardasil 9 series.

Limitations

Although the study was designed to reach all parents/legal guardians of students enrolled in PCMS, it is limited by those parents that did not respond to the educational mailer and did not attend parent/teacher conferences. Additionally, because HPV vaccination is not required for school attendance or to be reported to the state, the percentage of students already vaccinated, or vaccinated outside of the KidCare van is unable to be determined, skewing the actual percentage of vaccinated students. Parental education level regarding HPV and the Gardasil 9 vaccine were not evaluated, therefore making it difficult to determine the degree of effectiveness of the educational mailer and one-on-one educational encounters. Lack of an interpreter for non-english speaking parents was another limitation of this study.

Evaluation Plan

The goal of the data collected was to determine whether or not knowledge of HPV vaccination as a modality for cancer prevention increases parental consent for initiation of the Gardasil 9 series in 11 to 14 year olds attending PCMS, when compared to rates

from the previous year. In comparing vaccination rates from the same time frame from the previous year and six weeks post-education, a rise in rates would indicate the need for improved parent education on HPV vaccination and its cancer preventing capabilities.

The data retrieved from the KidCare van electronic records was divided by gender, race and age (11,12,13,&14). The data was entered into spreadsheets, analyzed, and then tables created to depict the vaccination rate comparisons from the two years. The survey items were assigned a number (1-4), entered into a spreadsheet, analyzed, and formatted into a graph to illustrate the parental barriers to HPV vaccination. The survey results are an important addition to the data gathered because they may indicate how future educational interventions could be tailored to help directly address parental concerns. Depending on what the analysis shows, education interventions similar to the one implemented in this study could be replicated in other school districts.

Plan for Sustainability

If HPV education emphasizing cancer prevention proves effective in increasing HPV vaccination rates among 11 to 14 year olds attending PCMS, annual or bi-annual attempts toward parent education using the format implemented in this study would be warranted to use in multiple school districts throughout southeast Kansas to improve the areas overall vaccination coverage. Plans to execute a universal educational intervention to be used throughout the counties in southeast Kansas would require a multidisciplinary approach in order to ensure sustainability. Collaboration between the various community health clinics and surrounding school districts would be essential for the replication and implementation of the parent HPV education program utilized in this study.

Summary

This chapter discussed in detail the population to be studied and procedure for study development and data collection. By comparing vaccination rates post-education to those in the prior year (with no education offered), we can assess if HPV education that focuses on cancer prevention plays a key role in obtaining parental consent to vaccinate, therefore, decreasing the long-term cancer risks associated with HPV exposure and infection.

Chapter IV

Evaluation of Results

Purpose

The purpose of this study was to compare HPV vaccination rates at Pittsburg Community Middle School after cancer-prevention education was provided at the 2018 parent-teacher conferences, to the rates from the previous year, when no education was provided, and to determine if education emphasizing cancer-prevention increased parental consent to begin the Gardasil 9 series for immunization against HPV. In addition, an opt-out survey was administered to willing parent/legal guardian participants to attempt to determine the barriers present preventing consent to vaccinate, so future education can be designed to directly address these concerns. Analysis of the data indicates cancer-prevention education targeted at parents/legal guardians of 11 to 14 year olds enrolled in PCMS did increase vaccination against HPV. Through data analysis, we can determine if middle schools in the remaining districts of Southeast Kansas could experience an increase in HPV vaccination rates among 11-14 year olds in those areas, therefore improving the overall vaccination status of the state of Kansas. This chapter discusses the population that was studied and analysis of the data collected as it relates to the project's purpose.

Sample

Once approval was gained from Pittsburg State University, SEK Community Health Center, and the school district's superintendent, data collection began at the completion of the six week period after parent-teacher conferences. Inclusion criteria for this study were adolescents (11 to 14 years old) enrolled in PCMS whose parents/legal guardians consented to initiate the Gardasil 9 vaccine series through the CHC's KidCare Van between October 25th, 2017-November, 29th, 2017 and October 25th, 2018-November 29th, 2018. Those who completed the Gardasil 9 series during these time frames were excluded from the study's population.

Data collection consisted of gathering PCMS's total student population and then the number of students in each grade (6th, 7th, & 8th) was determined. The number of parents/legal guardians who attended the 2018 parent/teacher conferences was also obtained so parental/legal guardian attendance for each grade could be decided as well. The student data collected was separated by gender, age, grade, and race/ethnicity.

Project Variables

The independent variable for this study was the education provided to the PCMS parents/legal guardians. The education, which emphasized the cancer-preventing benefits of HPV vaccination, included the informational mailer, which was mailed one week prior to the conferences, and the live one-on-one encounters with the additional educational tools from the CDC and American Cancer Society that took place during the 2018 PCMS parent-teacher conferences.

The dependent variables were parent/legal guardian knowledge of HPV and the Gardasil 9 vaccine prior to the educational interventions. The dependent variables were

affected by the provided education. In some instances, that consisted of the informational mailer only and, in others, a combination of the mailer and the one-on-one encounters with the additional educational tools. Previous HPV and Gardasil 9 knowledge was unable to be determined in this study; however, the perceived barriers to vaccinate were indicated on the opt-out survey. The effect on the dependent variables was shown in the comparison of the previous year’s vaccination rates to the rates six weeks post-education.

Analysis of Research Questions

At the beginning of this project, 683 students were enrolled at PCMS: 259 6th graders, 213 7th graders and 211 8th graders. The number of students that had either begun or completed the Gardasil 9 series were determined through the KidCare Van databases. Vaccination rates as of October 1st, 2018 were determined and separated into each grade (Table 1).

Table 1

Current Vaccination Rates by Grade as of 10/01/2018

Grade	Percent Vaccinated
6	9%
7	45%
8	52%

There is a large jump seen in the vaccination rates from the 6th to the 7th and 8th grades. The low percentage of 6th graders vaccinated is an indicator of why increased education and provider recommendation is important. As mentioned in chapter 1, beginning in February 2015, ACIP and CDC recommend vaccination with Gardasil 9 beginning as early as age 9. The 259 6th grade students at PCMS have been eligible to begin the Gardasil 9 series for a minimum of 2 years, yet less than 10% have reported

initiating HPV vaccination. The remaining 7th and 8th grade students have had access to the KidCare van vaccination services 1 to 2 years longer than their 6th grade counterparts and show significantly higher vaccination rates. Unfortunately, vaccination rates in all 3 grades fall well below the CDC's goal of 80%.

Research Question 1. What are the perceived barriers to HPV vaccination of adolescent parents/legal guardians in a rural southeast Kansas school district who opt-out of HPV vaccination for their child and attended parent-teacher conferences?

The perceived barriers to HPV vaccination were identified in the opt-out survey administered to willing parents/legal guardians who attended parent-teacher conferences. Unfortunately, the participation in the opt-out survey was minimal, consisting of only eight respondents. The opt-out survey consisted of a four question Likert-scale with the responses: Strongly Agree, Agree, Neither Agree or Disagree, Disagree, and Strongly Disagree (Table 2). Analysis of the opt-out survey results included a mean and SD of the responses to each question (Table 4).

Table 2

Responses to opt-out survey (n=8)

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I need more education about HPV and Gardasil	25%	63%	13%	0%	0%
My child’s doctor did not recommend HPV vaccination	0%	38%	63%	0%	0%
HPV vaccination conflicts with our religious beliefs	13%	0%	50%	13%	25%
My child is too young to learn about HPV	38%	38%	25%	0%	0%

The first question on the survey, “I need more education about HPV and Gardasil”, 63% of participants *Agreed*, 25% *Strongly Agreed*, and 13% *Neither Agreed or Disagreed*.

None of the participants answered with *Disagree* or *Strongly Disagree*. The mean response to this question was *Agree*. The response to question #2, “My child’s doctor did not or has not recommended HPV vaccination”, was split between *Agree* (38%) and *Neither Agree or Disagree* (63%), and had a mean answer of *Neither Agree or Disagree*.

Question #3, “HPV conflicts with our religious beliefs” had a predominately neutral response (50%); however, both 13% *Strongly Agreed & Disagreed*, resulting in a mean of *Disagree*. None of the participants *Disagreed* or *Strongly Disagreed* with the last question, “My child is too young to learn about HPV”. The mean response to this question was *Agree*.

Table 3

Agreement Scale

Response	Standard Deviation
Strongly Agree	4.5-5.0
Agree	3.5-4.49
Neither Agree or Disagree	2.5-3.49
Disagree	1.5-2.49
Strongly Disagree	1-1.49

Table 4

Mean & SD of opt-out survey responses (n=8)

	Mean	SD
I need more education about HPV and Gardasil	4.13	.64
My child's doctor did not or has not recommended HPV vaccination	3.38	.52
HPV vaccination conflicts with our religious beliefs	2.63	1.3
My child is too young to learn about HPV	4.13	.83

The SD for questions 1, 2, & 4 was less than 1, which indicates little variation among the replies. The SD for question 3 was greater than 1 at 1.3, showing a much broader reaction to this topic. Overall, the majority of respondents *Agreed* more education was required and the age their child was an issue in consenting to vaccination.

Research Question 2. Will education focusing on cancer prevention increase parental consent to vaccinate against HPV in 11 to 14 year olds among the parents/legal guardians

that received the mailer and those who received the mailer, as well as attended parent-teacher conferences in 2018?

Parent-teacher conference attendance was determined to efficiently answer this research question. The total number of parents attending parent-teacher conferences was collected with the assistance of the KidCare van nurse practitioner and the PCMS school nurse (Table 5).

Table 5

2018 Parent-teacher conference attendance by grade

Grade	Parental Attendance
6	57%
7	45%
8	39%

Parent/legal guardian attendance was then further analyzed to verify which parents/legal guardians did not attend the conferences but did receive the informational mailer versus the group who both received the informational mailer and the live one-on-one educational encounters by being present at one of the conference sessions. Through the KidCare Van immunization databases, the children with parents/legal guardians in these groups were identified. The students' information was then categorized by gender, age, grade, and race/ethnicity.

Table 6

Vaccine initiation between 10/25/18-11/29/18 for those who received the informational mailer only

Gender	Age	Grade	Race/Ethnicity
Male	13	7	Caucasian
Male	12	7	Biracial
Male	13	8	Caucasian
Male	11	6	Caucasian
Male	12	6	African/American
Male	12	6	African/American
Male	13	7	African/American

Table 7

Vaccine initiation between 10/25/18-11/29/18 for those who received the informational mailer and the one-on-one educational encounter at parent-teacher conferences

Gender	Age	Grade	Race/Ethnicity
Female	11	6	Caucasian
Female	12	6	Caucasian
Female	13	7	Caucasian
Female	12	7	Caucasian
Male	13	7	Caucasian
Female	13	8	Caucasian

Tables 5 and 7 show a correlation between parent/legal guardian attendance and vaccine initiation. Sixth and seventh graders were also the larger group with consent to vaccinate among those who did not attend any of the conference sessions. The KidCare van administered the first Gardasil 9 injection to a total of 13 PCMS students in the six weeks post education.

Research Question 3. Will the SEK Community Health Center KidCare school health van see an increase in vaccination among 11 to 14 year olds six weeks post education in

children whose parents/legal guardians received the informational mailer and those that received the mailer and one-on-one education at parent-teacher conferences vs the 2017 fall semester when no education was provided?

KidCare van immunization databases were accessed to determine the number of students who were consented to initiate the Gardasil-9 series in the fall of 2017 between the dates of October 25th and November 29th (Table 8).

Table 8

Vaccine initiation between 10/25/17-11/29/17 when no education was provided

Gender	Age	Grade	Race
Female	12	7	Caucasian
Female	12	6	Caucasian
Male	12	6	Hispanic
Female	12	6	Caucasian
Male	13	7	Caucasian
Male	12	7	Asian/Islander

There were a total of 6 students who initiated HPV vaccination in the fall of 2017, when no education was provided. There was an equal rate of consent among 6th & 7th graders. No 8th graders received the initial injection.

When comparing tables 3, 4, & 5, there is an increase in the number of students that began the Gardasil 9 series. During the fall of 2017, a total of 6 students (3 boys, 3 girls) in the 6th and 7th grades only received the first Gardasil 9 shot through the KidCare van. At project completion (11/29/18), 13 students (8 boys, 5 girls) from all grades began the HPV vaccine series with the van, doubling the total from the previous year. This increase in vaccination by grade level caused a school-wide vaccination rate increase as well (Table 9).

Table 9

Comparison of school vaccination rates by grade from before project and at project completion

Grade	10/01/18 Vaccination Rate	11/29/18 Vaccination Rate
6	9%	12%
7	45%	48%
8	52%	53%

Summary

Results of data analysis and comparison revealed findings significant to the purpose of the study. The research was designed to show HPV education, with an emphasis on cancer-prevention, increases the likelihood of parental consent to vaccinate with Gardasil 9 among the 11 to 14 year old age group. Research outcomes indicate education focusing on the cancer-preventing benefits of vaccinating against HPV may have a positive effect on obtaining vaccination consent.

When no attempt was made for an educational intervention, only 6 in a student body population of 683 received the Gardasil 9 shot through the KidCare van in the fall of 2017. After implementation of an educational intervention targeted at the parents/legal guardians of this age group, there was an increase in consent to vaccinate, with each grade experiencing a rise in the percent of students vaccinated by project completion.

The attempt was made in this study to identify parental barriers that reflect current vaccination concerns. Although the opt-out survey response was minimal, evaluation of the collected data does help to provide insight on parental barriers to vaccinate. Even

with the small response, lack of education and child's age stood out as factors that may be inhibiting a more significant rise of vaccinated children in the 11 to 14 year old age group.

Chapter V

Discussion

The intention of this project was to evaluate the effects of an educational intervention focusing on the cancer prevention benefits of HPV vaccination in the 11 to 14 year old age group. The number of students who initiated the Gardasil 9 series from October 25th, 2017-November 29th, 2017 were compared to the students who initiated the series in the same time frame in 2018 after HPV vaccine education was implemented at the 2018 parent-teacher conferences. The data collected indicates HPV vaccine education, with an emphasis on cancer prevention, does increase parental consent to initiate the Gardasil 9 series among 11 to 14 year olds.

Relationship of Outcomes to Research

The 11 to 14 year old age group is the prime cohort to be vaccinated against HPV because most have yet to be exposed to the virus (Castle & Maza, 2015). The project questions address parental barriers and the effects of HPV vaccine education on parental consent to vaccinate. Previous research has also addressed these factors to provide insight on how vaccination efforts can be improved in order to reach the CDC's 2020 goal of an 80% nation-wide HPV vaccination rate, in both males and females.

The opt-out survey was utilized in this study to attempt to identify parental barriers toward HPV vaccination in order to customize future educational interventions to

directly address these concerns. From the topics addressed in the survey, both lack of education about HPV and Gardasil 9 and the child's age were the barriers most participants agreed were inhibiting them from providing consent to have their child vaccinated. These findings do coincide with barriers identified in prior research. In studies where an effort to increase HPV vaccine knowledge was made, an increase in consent to vaccinate was noted (Vielot et al., 2017; Brown, Gobra, & Pellman, 2017; VanWormer, et al., 2017; Cates et al., 2011). Rise in vaccine initiation was as low as 2% in one study, but there was an increase nonetheless (Cates et al., 2011). Previous studies also recognized "lack of provider recommendation" as a primary reason Gardasil 9 had yet to be initiated in the 11 to 14 year old age group (Brown, Gobra, & Pellman, 2017). However, the opt-out survey participants responded neutrally regarding this topic, which was inconsistent with the studies reviewed for this project. This may be attributed to only 8 surveys being returned for data collection and analysis.

Provider intervention, which served as the basis for this study, has also proven effective in increasing HPV vaccination rates in this study's targeted age group (Henninger et al., 2017; McLean et al., 2017). The informational mailer and live one-on-one education encounters were designed to enhance trust, rapport, and communication between PCMS parents/legal guardians, the SEK CHC, KidCare van nurse practitioner, and the immunization services they provide. These were identified as key components by a study conducted at the Kaiser Permanente Center in Portland, Oregon, when developing an educational intervention to increase parental consent to vaccinate against HPV (Henninger et al., 2017). Effectiveness of education designed with these factors in mind was reflected in both groups of parents/legal guardians (those that received the

informational mailer only and those who received the mailer and attended one of the parent-teacher conference sessions) in this study. Seven students initiated the Gardasil 9 vaccine in the group that received the informational mailer only and six students initiated the Gardasil 9 vaccine whose parents/legal guardians received the mailer and attended one of the parent-teacher conference sessions. When the data collected from these two groups was compared to the same six week time period from the previous year, where no education was provided, a significant increase in the students beginning the Gardasil 9 series was noted. Between October 25th and November 29th, 2017, six PCMS students were allowed by their parents/legal guardians to initiate HPV vaccination through the CHC KidCare van. Thirteen students began the series with the KidCare van during this same time frame in 2018 after the educational intervention was implemented.

Considering the number of students vaccinated essentially doubled, the educational intervention designed based on prior research findings coincides with the results seen in other studies where similar designs were utilized. However, other studies where a provider-mediated educational intervention was implemented outside of the clinical setting were not found for review in this project. Therefore, the basis for comparison between the school setting and clinical setting may not be unilateral.

Observations

Noteworthy observations of this study include the amount of education required to make an impact on HPV vaccination. With implementation of the HPV educational intervention, in the form of the informational mailer and live one-on-one encounters, a notable increase in the number of students who received the initial Gardasil 9 injection was seen in comparison to the previous year. The overall results shown in this study are

reassuring for improving vaccination rates in 11 to 14 year olds. The one-on-one educational encounters were a reiteration of the information included in the mailer with the addition of the PSA announcements and printed fact sheets from the reputable websites mentioned in the mailer. However, the results showed more parents/legal guardians gave consent to vaccinate in the group that received the informational mailer only. There was not a significant difference between the two groups, with the mailer only group being larger by one student but it is curious the group that received additional education by attending parent-teacher conferences had the same rate of consent. Therefore, indicating that more education may not be directly proportional to a higher rate of vaccination.

An additional noteworthy finding is the gender of the students that were ultimately vaccinated. Only parents of male students consented to HPV vaccination based on the education provided in the informational mailer alone. In the parent group that received the mailer and attended parent-teacher conferences, all but one of the students consent was provided for were female. Although the study results revealed HPV vaccine education emphasizing cancer-prevention benefits had a positive effect on the vaccination rates in all grades at PCMS, the data did not indicate the amount of education appropriate to instigate the desired response.

Evaluation of Theoretical Framework

The theoretical framework applied in this study was the Vaccine Perceptions, Accountability, and Adherence model. In order to achieve vaccine adherence, vaccine acceptance among the involved parties must occur (Katz et al., 2010). This study was designed with that very premise in mind. The educational interventions implemented in

this study focused on getting parents/legal guardians to view and accept the HPV vaccine as cancer prevention, not STI prevention. For this mind set to be accomplished, barriers to acceptance had to be addressed as well. The framework selected addresses multiple potential barriers experienced by parents/legal guardians and the adolescent themselves. Although adolescent behavior leading to vaccine inhibiting factors was not included in this study, the barriers on the part of the caregiver were taken in to account. The primary structural and societal factor proposed in this model and included in the study was vaccine availability and cost. The informational mailer and live one-on-one education made parents/legal guardians aware both injections in the Gardasil 9 series were offered at the school and at no cost to them. The opt-out survey included a few of the topics related to the model's caregiver barriers. Health beliefs and healthcare utilization were imbedded into the questions regarding HPV and Gardasil 9 knowledge, provider recommendation, and religious beliefs affecting healthcare decisions. However, the barriers were merely identified in this study and not addressed with education designed to directly answer or clarify caregiver concerns.

In some instances, parent/legal guardian acceptance of HPV vaccination occurred with the additional education provided in the informational mailer and live one-on-one encounters only. This led to authorization of consent to vaccinate through the KidCare van, and eventual adherence due to the child being entered into the KidCare van's database and flagged to complete the Gardasil 9 series. The Vaccine Perceptions, Accountability, and Adherence framework was reflected in these cases.

Evaluation of Logic Model

In Chapter 1, a logic model was provided to show the short, intermediate, and long term outcomes of implementing an educational intervention emphasizing the cancer-preventing benefits of HPV vaccination in 11 to 14 year old adolescents enrolled in PCMS. The logic model shows the components necessary to develop a successful intervention and the parties required for collaboration. Initial input required to develop and implement HPV education to the parents of PCMS students occurred between the researcher and the SEK CHC. The Immunization Innovation Grant awarded to the CHC set the parameters for the timing and planning of the study. Additional input and permission was required in the early development stages from the USD 250 superintendent, PCMS administrative staff and school nurse, and CHC KidCare van. The informational mailer and live one-on-one educational sessions at the 2018 parent-teacher conferences were the educational interventions described in the outputs of the logic model. The pre and post-education PCMS vaccination rates are also included in the outputs of the logic model.

An increase in 11-14 year old PCMS students vaccinated against HPV was depicted in the short-term outcomes of the logic model and supported by the study's results. Change in HPV vaccine perception and increase parent HPV education were addressed throughout the study but were not measured, and therefore were not supporting this aspect of the logic model. The intermediate and long-term outcomes were a projection of future effects that extend beyond the time frame in which this study was completed, which was not proven with the results of this study. However, achievement of these outcomes is promising based upon this data analysis.

Limitations

Even though the results supported the purpose of the research, this study is not without bias and limiting factors. One area of bias can be seen in the lack of a Spanish interpreter's presence at the live one-on-one encounters at parent-teacher conferences. A Spanish copy of the informational mailer was included in every mailer sent but the absence of an advocate at the conference sessions may have hindered the willingness of Spanish parents to provide consent to vaccinate. The data gives basis to this speculation because there were no Hispanic students vaccinated from either parent group after the 2018 conference sessions.

Evaluation of parent/legal guardians prior and current HPV knowledge was not measured in this project. The informational mailer and live one-on-one educational encounters were designed with the mindset that parent/legal guardians had none to minimal knowledge of HPV vaccination as it relates to cancer prevention. A tangible method to accurately determine parent/legal guardian HPV and Gardasil 9 knowledge would have indicated the type and level of education necessary to instigate providing consent to vaccinate. In this study's results, it is difficult to know if the parents/legal guardians who received the mailer only consented to vaccination because they possessed a higher knowledge of HPV and/or Gardasil 9 than the group that required the informational mailer and live one-on-one educational encounters to authorize consent.

Time also played a factor in data collection and analysis. Because this study was conducted in collaboration with the CHC's Immunization Innovation Grant, educational interventions had to be implemented within the specific time frame outlined in the grant. As a result of the time constraints, tools and instruments developed were unable to be

revised and edited prior to the conference dates. The time allotted for data collection could also be considered a limiting factor. Six weeks post-education is an adequate amount of time to determine effectiveness of the educational interventions implemented, but a longer time frame for research may have yielded greater results.

The most significant limiting factor in this study is the opt-out survey administered at the conference sessions. As mentioned previously, time constraints did not allow for editing and revisions. The first question on the survey, “I need more education about HPV and Gardasil 9”, would have provided more statistically relevant responses if it had been broken into two separate questions, one asking about HPV education and another inquiring about Gardasil 9 education. The survey also lacked questions regarding Gardasil 9 side effects. Parental concerns of adverse side effects could negatively affect vaccine uptake if not thoroughly addressed. Additionally, the minimal survey response limits the study as well. The eight surveys collected and analyzed aid in providing insight about parental barriers to HPV vaccination, but such a small response neither proves nor disproves any one factor as a predominant barrier to vaccinate.

Implications for Future Research

Less than 39% of age eligible Kansas residents have been vaccinated against HPV (Kansas HPV vaccination rates, 2019). In southeast Kansas, only 7-13% of 11-18 year olds have completed the Gardasil 9 series (Kansas HPV vaccination rates, 2019). With the knowledge that HPV is responsible for a multitude of cancers affecting both men and women, developing an initiative to increase vaccination rates is crucial. Targeting the age group likely not to have been exposed to the virus is also beneficial if there is going

to be a significant impact on reducing HPV-related cancers. These low statistics provide the necessary evidence to support and develop projects to identify parental barriers to HPV vaccination and provide education on the cancer-preventing benefits of the Gardasil 9 series, specifically in the 11-14 year old age group.

This author's project has provided a solid foundation for further research into the realm of improving HPV vaccination rates in adolescents. It would be beneficial for future research to include a method to determine the level and source of a caregiver's HPV and Gardasil 9 knowledge prior to any education provided. These results could help researchers better understand the type and amount of education necessary to increase parent/legal guardian acceptance of HPV vaccination as a cancer prevention modality.

The gender discrepancy noted in this study's results warrants further research to determine if the adolescent's gender plays a role in the information and education necessary to authorize vaccination. The findings of this research suggest parents/legal guardians of female children may require more education on HPV and the Gardasil 9 vaccine prior to authorizing consent for immunization than those with male children. This would provide valuable information in the development of future educational interventions.

Identifying specific parental barriers to HPV vaccination is another crucial point that requires more research. Although the opt-out survey utilized in this study was limited, the previously discussed revisions could make it a valuable tool for future research.

Additionally, an effort to increase survey participation would make any data collected more sound and reliable when developing educational interventions. By understanding the amount of education needed and which concerns to directly address, great strides

could be made in creating acceptance of and adherence to HPV vaccination of 11 to 14 year old adolescents.

Implications for Practice, Policy, and Education

In rural communities, parents/legal guardians are not fully aware of HPV and its cancer-causing capabilities (Thomas, 2016). Routine vaccination against HPV in the clinical practice setting would reduce the incidence of future diagnoses. Many initiatives have been implemented in the southeast Kansas region to trigger an increase in vaccination. The CHC's Immunization Innovation grant is an example of one of these initiatives. This author worked in collaboration with CHC to fulfill the requirements of the grant. The research project developed and implemented by this author was included in the action plan of the grant and the study's results were included in the grant's final report. Additionally, the data collected in this study was reported to the Quality Assurance Committee at CHC during their monthly meeting in February 2019 (Appendix C). At this meeting, replication of this project in the other school districts served by CHC was proposed as a future initiative to increase HPV vaccination rates throughout the southeast Kansas region.

The CHC's partnership was invaluable to this project and led to the Merck (manufacturer of Gardasil 9) representative for southeast Kansas to reach out to this author for further inquiry regarding the project's methodology. Significant interest on behalf of the Merck representative awarded this author an invitation to present this study and its findings at the March 2019 meeting of the Kansas Immunization Coalition. Meeting attendance included representatives from Merck, American Cancer Society, SEK CHC, Crawford County Health Department, Ascension Via Christi Oncology, and

Kansas University Cancer Education Outreach. The data collected in this study was presented and the informational mailer and opt-out survey were provided to those in attendance as well. The CHC representative expressed interest on behalf of the CHC's school health coordinator to replicate this study in the other southeast Kansas school districts serviced by CHC. Additionally, the Merck representative articulated interest in implementing use of the informational mailer in Johnson County Kansas school districts. Potential use of this study's methodology and educational tools outside of southeast Kansas speaks volumes toward the validity of this research.

Conclusion

In conclusion, the aim of this scholarly project was to increase HPV vaccine uptake of the PCMS student body through parent-targeted HPV education that emphasizes cancer prevention. Comparison of vaccination rates from October 25th-November 29th in 2017 and 2018 showed an increase in the number of students who began the Gardasil 9 series after education was provided. The outcome of the study enhanced the awareness of healthcare providers about the importance of parental HPV education in improving vaccine uptake. Even though the study's results are promising on the effectiveness of cancer prevention HPV education on vaccine initiation, recommendations for further research were addressed. The results of the project determined additional research is warranted to determine the HPV education level necessary for consent to vaccinate to occur. In order to achieve an HPV vaccination rate of at least 80%, providers must continue to educate patients and their parents/legal guardians on the cancer-preventing benefits of Gardasil 9. High vaccination rates are associated with a decrease in HPV diagnosis (Katz et al., 2010). If vaccination uptake

does not increase among 11 to 14 year olds, healthcare providers will continue to spend time and resources diagnosing and treating HPV-related cancers. The need for continued attempts at caregiver acceptance of HPV vaccination as cancer prevention is as crucial as ever. The poet Maya Angelou stated, “Do the best you can until you know better. Then when you know better, do better.” This quote effectively describes the development, implementation, and future possibilities of this scholarly work. The education created and carried out in this project placed a great deal of emphasis on overcoming the known barriers against HPV vaccination and communicating the cancer-preventing benefits of vaccinating with Gardasil 9. The data collected in this study presents opportunities to learn more about caregiver concerns, that lead to improved educational interventions and a better effort on behalf of healthcare providers to create acceptance of HPV vaccination as cancer prevention.

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APPENDIX

Appendix A:



Community Health Center of Southeast Kansas

3011 N Michigan • P.O. Box 1832 • Pittsburg, KS 66762 • (620)231-9873 • Fax: (620)231-5062

HPV Vaccine Opt-Out Survey

If you have chosen to opt-out of consenting for HPV vaccination for your child, we ask that you please take a moment to complete a short survey on the reason(s) you prefer not to have Gardasil administered to your child. Results will aid us in providing educational information that directly addresses your concerns. Thank You!

	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
I need more education about HPV and Gardasil	1	2	3	4	5
My child's doctor did not or has not recommended HPV vaccination	1	2	3	4	5
HPV vaccination conflicts with our religious beliefs	1	2	3	4	5
My child is too young to learn about HPV	1	2	3	4	5

Should you have questions about the HPV Vaccine, please contact your provider or the PCMS school nurse, Beth Kimzey at 620-235-3248

Appendix B:



**Community Health Center
of Southeast Kansas**

3011 N Michigan • P.O. Box 1832 • Pittsburg, KS 66762 • (620)231-9873 • Fax: (620)231-5062

Dear Parents of PCMS Students:

Community Health Center of Southeast Kansas (CHC/SEK), in partnership with USD 250, is working on an initiative to increase the number 11-14 year olds in the community that have been vaccinated against the Human Papillomavirus (HPV) with the Gardasil vaccine. As of 2015 the Centers for Disease Control (CDC) and the Advisory Committee for Immunization Practices (ACIP), recommend Gardasil vaccination *for boys and girls starting at age 9.*

Health care providers diagnose approximately 33,000 new cases of HPV-related cancers each year. We know that you make many decisions to keep your child free from diseases and we would like to assist you in that endeavor. The HPV vaccine can help protect your child from nine HPV-related cancers including cervical cancer in women and cancers found in the mouth and back of throat in men and women. The HPV vaccine works best when it is given to a child prior to exposure to the virus. Just as having your child use a seat belt or bicycle helmet to protect their health, the HPV vaccine protects children from HPV-related cancers that may develop should they someday come in contact with the virus.

Please review the information provided in this packet. The HPV vaccine is safe and can help to protect your child from cancer. The Community Health Center will have an information table at PCMS parent/teacher conferences on October 16th, 17th, & 19th to provide further information regarding the HPV vaccine and to answer any questions you may have about vaccinating your child. If for some reason you are unable to attend parent/teacher conferences, please feel free to check the following websites for additional information: Centers for Disease Control (www.cdc.gov), American Cancer Society (www.cancer.org), American Academy of Pediatrics (www.aap.org), SEK Community Health Center (www.chcsek.org).

HPV vaccine is available to all PCMS students through Community Health Center's KidCare Van, which visits the school every Thursday. Enclosed is a consent form from Community Health Center to provide the HPV vaccine to your child.

Please feel free to drop completed forms off to the CHC information table during conference times or to Beth Kimzey in the school health clinic or school office.

Sincerely,

Community Health Center of Southeast Kansas



Community Health Center of Southeast Kansas

3011 N Michigan • P.O. Box 1832 • Pittsburg, KS 66762 • (620)231-9873 • Fax: (620)231-5062

Estimados padres de familia de la escuela Intermedia PCMS:

La Clínica Community Health Center of Southeast Kansas (CHC/SEK), en asociación con las escuelas de USD 250, están trabajando en una iniciativa para aumentar el número de jóvenes de 11-14 años que hay en nuestra comunidad para que reciban la vacuna Gardasil que protege contra el virus del papiloma Humano (VPH). En el 2015 el Centro para el Control y la Prevención de Enfermedades y el Comité de para las prácticas de vacunas recomendaron que era muy necesario vacunar a los varones y mujeres a partir de los 9 años.

Aproximadamente 33,000 casos nuevos relacionados al HPV-cáncer son diagnosticados cada año. Sabemos que ustedes toman muchas decisiones para mantener a su estudiante libre de enfermedades y es por eso que quisiéramos ayudarles. La vacuna HPV (siglas en inglés) podrá ayudar a proteger a su hijo en contra nueve tipos de Cáncer relacionados a este virus, el cual incluye el cáncer al cuello uterino en las mujeres y el cáncer en la boca y en la parte de atrás de la garganta en ambos mujeres y hombres. La vacuna HPV trabaja mejor cuando se aplica al niño antes de que esté expuesto al virus. Así como ustedes protegen a sus hijos cuando les hacen usar el cinturón de seguridad o usar un casco cuando monta una bicicleta, la vacuna HPV protegerá a los niños de los cánceres relacionados al HPV que podrían desarrollarse, si alguna vez estuvieran en contacto con el virus.

Por favor lea la información proveída en este paquete. La vacuna HPV es segura y puede proteger a su hijo/a en contra del cancer. La clínica Community Health Center tendrá una mesa con información durante las conferencias de padres y maestros el 16, 17, y 19 de octubre, para ofrecerles más información acerca de la vacuna y para responder cualquier pregunta que tengan. Si por alguna razón usted no puede asistir a sus conferencias, por favor lea y mire las siguientes páginas en la red: Centers for Disease Control (www.cdc.gov), American Cancer Society (www.cancer.org), American Academy of Pediatrics (www.aap.org), SEK Community Health Center (www.chcsek.org).

La vacuna HPV está a disposición para todos los estudiantes de PCMS en la van móvil, la cual está en la escuela cada jueves. Hojas de consentimiento estarán ofrecidas en la escuela y también durante las conferencias. *Muchas gracias adelantadamente si su hijo/as ya recibió una o dos dosis de la vacuna Gardasil para la protección y asegúrese que reciban todas las dosis necesitadas.*

Por favor complete las hojas en la mesa de informaciones de CHC durante las conferencia o comuníquese con Beth Kimzey en la clínica de la escuela. Si tiene preguntas, por favor llame al 620-235-3240.

Sinceramente, Community Health Center of Southeast Kansas

HPV Vaccine Questions and Answers

What is HPV?

HPV stands for Human Papillomavirus, which is a common virus that is spread through intimate skin-to-skin contact with someone who has the virus. HPV can be passed to others even when an infected person has no signs or symptoms. You can develop symptoms years after exposure, making it difficult to know when you first became infected. In many cases HPV resolves on its own and does not cause any health problems. However, when HPV does not go away, the infection can cause cervical, vaginal, vulvar, penile, anal, and mouth & throat cancers. The HPV vaccine can protect against the strains of the virus that most commonly cause cancer in both men and women.

Why is HPV vaccine recommended at age 11-14 years?

For HPV vaccine to be most effective, the series should be given before exposure to HPV. CDC recommends that the HPV vaccine be administered with the Tdap booster and meningococcal vaccine. The vaccine can be administered as young as 9 years old. This way, a child is protected prior to exposure to the virus later in life.

How many doses in the HPV vaccine series?

When a child receives the vaccine before the age of 15, only 2 doses are needed. These doses are administered 6 months apart. There is no reason to wait to vaccinate your child. Preteens should receive all recommended doses of the HPV vaccine series before exposure later in life to achieve the maximum cancer preventing benefits.

Is the HPV vaccine safe?

Like all vaccines, HPV vaccine is monitored on an ongoing basis to make sure it remains safe and effective. The United States currently has the safest, most effective vaccine supply in history. Years of testing are required by law to ensure the safety of vaccines before they are made available to the public. This process can take 10 years or longer. Once a vaccine is in use, the CDC and Food and Drug Administration (FDA) monitor any associated side effects or possible side effects through the Vaccine Adverse Event Reporting System and other vaccine safety systems. No serious safety concerns were identified in these clinical trials. FDA only licenses a vaccine if it is safe, effective, and the benefits outweigh the risks.

How common are HPV infections?

Approximately 76 million Americans are currently infected with HPV. There are about 14 million newly diagnosed infections each year. HPV is so common that most sexually active men and women will get at least one type of HPV at some point in their lives.

How common are cancers related to HPV?

Of the millions infected with this virus, it is estimated that 33,000 of these cases will result in either cervical, vulvar, anal, oropharyngeal, or penile cancers per year. The incidence for HPV related-cancers is as follows: 96%-99% of cervical cancers, 90%-93% of anal cancers, 12%-63% of oropharyngeal (mouth & back of throat) cancers, 36%-40% of penile cancers, 40% of vaginal cancers, and 40%-51% of vulvar cancers. Cervical cancer is the most common HPV-related cancer in the US and one of the leading causes of death among women around the world.

Does the HPV vaccine work?

HPV vaccines work extremely well. Clinical trials showed HPV vaccines provide close to 100% protection against cervical precancers. Since the first HPV vaccine was recommended in 2006, there has been a 64% reduction in HPV infections caused by the strains covered in the vaccine. HPV vaccines offer long-lasting protection against HPV infection and there has been no evidence to suggest the vaccine loses any of its protective capabilities over time.

Preguntas y Respuestas acerca de la Vacuna HPV

Que es el VPH (HPV siglas en inglés)?

VPH significa Virus del papiloma Humano, que es una virus muy común que se contrae cuando tienen contacto íntimo de piel a piel con alguien que tenga el virus. Este virus puede ser transmitido incluso cuando la persona infectada no tiene síntomas. Uno puede desarrollar los síntomas años después de haber sido expuesto, lo cual hace difícil saber cuándo uno fue infectado. En muchos casos el VPH se resuelve solo y no causa ningún problema de salud. Sin embargo cuando el virus no se desaparece, la infección puede causar cáncer uterino, y otros cánceres como el de vulva, vagina, pene o ano. También puede causar cáncer en la garganta y la boca. La vacuna VPH puede proteger en contra las diferentes clases del virus que más comúnmente causan el cáncer en ambos hombres y mujeres.

¿Por qué se recomienda la vacuna HPV (siglas en inglés) durante los años 11-14?

Para que la vacuna tenga mejor efecto, las series de la vacuna deben ser administradas antes de que uno esté expuesto al HPV. La agencia CDC (centro del control de enfermedades) recomienda que la vacuna HPV debe ser administrada al mismo tiempo de el refuerzo de la vacuna TDap y la vacuna contra la meningitis. La vacuna VPH puede ser administrada temprano como a los 9 años. De esta manera, el niño ya está protegido antes de contraer el virus más tarde en su vida.

¿Cuántas dosis es la serie de la vacuna HPV?

Cuando un niño recibe la vacuna antes de los 15 años, solo se necesita dos dosis. Estas dosis son administradas entre seis meses de diferencia. No hay ninguna razón para esperar y vacunar a su niño. Los pre-adolescentes deberían recibir todas las dosis recomendadas de la vacuna antes de ser expuestos al virus en el futuro de sus vidas, cosa que podrán tener los mejores beneficios y prevenir el cáncer.

¿Es la vacuna HPV segura?

Como cualquier vacuna, la vacuna HPV es monitoreada continuamente para asegurarse que permanece segura y eficaz. Actualmente, los Estados Unidos tiene el suministro más seguro, y efectivo en su historia. La ley exige muchos años de pruebas para garantizar la seguridad de las vacunas antes de que estén disponibles al público. Este proceso a veces se demora unos 10 años o más. Una vez que la vacuna esté en uso, la organización CDC y la Administración de Alimentos y Medicinas (FDA) monitorea cualquier contraefecto asociados o posibles efectos secundarios a través del Sistema de Notificación de Eventos Adversos y con otros sistemas de seguridad de vacunas. Con esta vacuna, no se identificaron problemas de seguridad graves en los ensayos clínicos. La FDA sólo otorga licencia a las vacunas que son seguras, sanas y efectivas y que los beneficios superan los riesgos.

¿Cuán común son las infecciones del HPV?

Aproximadamente 76 millones de Americanos están infectados actualmente con el virus VPH y aproximadamente 14 millones reciben un nuevo diagnóstico cada año. El VPH es tan común que la mayor parte de los hombres y mujeres que están sexualmente activos contraerán por lo menos un tipo de virus en algún tiempo en sus vidas.

¿Cuán común son los cánceres relacionados al HPV?

De los millones infectados con este virus, estimamos que 33,000 de esos casos resultan en cáncer uterino, vulvar, anal, oropharyngeal, o cáncer al pene cada año. Los incidentes de los cánceres relacionados al VPH es como sigue: 96%-99% cánceres uterinos, 90%-93% cánceres anales, 12%-63% cancer oropharyngeal (boca & atrás de la garganta), 36%-40% cánceres al pene, 40% cánceres vaginales, y 40%-51% cáncer vulvar. El cáncer uterino es el más común en los EEUU y uno de los principales en causar la muerte en mujeres en el mundo.

¿Trabaja la vacuna HPV?

Las vacunas HPV trabajan extremadamente bien. Durante los ensayos clínicos, las vacunas HPV demostraron a proveer más o menos un 100% de protección en contra los cánceres uterinos. Desde que se recomendó la vacuna en el 2006, han habido un 64% reducción en las infecciones causadas por los diferentes tipos cubiertos en la vacuna. Estas vacunas ofrecen una larga protección en contra el virus e infección HPV y no ha habido evidencia que muestre que la vacuna pierda alguna de su capacidades protectoras con el tiempo.

Appendix C:

4/10/19

**Increasing HPV
Vaccination Rates
Among 11-14 year olds**

SHANNON DUNCAN
PSU BSN-DNP STUDENT
MARCH 8TH, 2019

Scholarly Project

- ◆ Purpose of the project is to have an impact on the healthcare system and quality of care
- ◆ Will bring forth specific benefits for a group, population, community, or policy and will advance nursing practice at a local, state, or national level.
- ◆ I have chosen to identify modalities to improve HPV vaccination among 11-14 year olds in southeast Kansas to decrease the risks of exposure and development of HPV related cancers in this cohort.

Project Design

- ◆ Contact was made with Dawn McNay at the CHC to discuss project details and have permission granted to collaborate with the CHC fulfilling the requirements of their immunization grant.
- ◆ The study idea was then presented to the superintendent of the school district principal and on-campus school nurse
- ◆ HPV vaccine protocol and procedure was then discussed with the PCMS
- ◆ One week prior to parent/teacher conferences, a HPV information packet was mailed to all parents/legal guardians of students enrolled at PCMS
- ◆ As parents checked-in for conferences, HPV vaccination status for their child(ren) was inquired about as they passed by the information table set-up at the main entrance.

Project Design

- Parents/legal guardians were then encouraged to either submit consent to vaccinate at that time or complete the opt-out form and survey
- HPV vaccination rates from October 25th, 2017 thru November 30th, 2017 were collected
- Six weeks post-education vaccination rates for those that initiated the HPV vaccine series were obtained to determine if HPV vaccination rates had improved from the previous year
October 25, 2018-November 30, 2018

PCMS Vaccination Rates as of 10/01/2018

	Percent Vaccinated
6 th Grade	9%
7 th Grade	43%
8 th Grade	52%

Vaccination Initiation Between 10/25/2017-11/30/2017

Gender	Age	Grade	Race
Female	12	7th	Caucasian
Female	12	6th	Caucasian
Male	12	6th	Hispanic
Female	12	6th	Caucasian
Male	13	7th	Caucasian
Male	12	7th	Asian/Pacific Islander

Parent-Teacher Conference Attendance

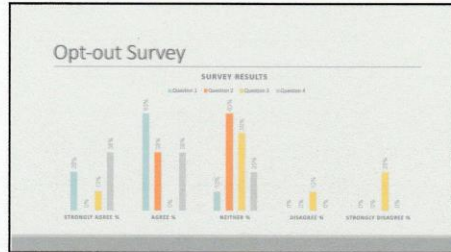
Parental Attendance	
6 th Grade	57%
7 th Grade	45%
8 th Grade	39%

Vaccination Initiation Between 10/25/2018-11/30/2018

Gender	Age	Grade	Race	Gender	Age	Grade	Race
Male	13	7th	Caucasian	Female	11	6th	Caucasian
Male	12	7th	Hispanic	Female	12	6th	Caucasian
Male	13	8th	Caucasian	Female	13	7th	Caucasian
Male	11	6th	Caucasian	Female	12	7th	Caucasian
Male	12	6th	African/American	Male	13	7th	Caucasian
Male	13	6th	African/American	Female	13	8th	Caucasian
Male	13	7th	African/American				

PCMS Vaccination Rates At Project Completion (11/30/2018)

Percent Vaccinated	
6 th Grade	12%
7 th Grade	48%
8 th Grade	53%



Limitations

- The project is limited by those parents who did not respond to the informational packet and did attend parent/teacher conferences.
- The percentage of students already vaccinated and/or vaccinated outside of the KidCare Van is unable to be determined, unless the parents have reported the student's vaccination status to the school.
- Although the mailed HPV information packet was offered in Spanish, no one-on-one education was available for Spanish-speaking parents.
- Unable to determine the level of HPV and/or Gardasil education prior to mailed information packet and parent-teacher conference attendance is unable to be determined.
- Minimal survey response makes it difficult to clarify the parental barriers against HPV vaccination and modify future education to reflect these concerns.

Conclusion

- Vaccination rates in the 6 week period after parent-teacher conferences doubled compared to the previous year when no education was provided.
- HPV education emphasizing cancer prevention has proven effective in increasing HPV vaccination rates among 11-14 year olds attending PCMS, therefore annual or bi-annual attempts toward parent education using the format implemented in this study could be warranted to use in multiple school districts throughout southeast Kansas to improve the areas overall vaccination coverage.

Appendix D:

**Pittsburg State University
Application for Approval of Investigations
Involving the Use of Human Subjects**

This application must be completed by the Investigator and sent to the Office of Graduate and Continuing Studies by the first Tuesday of the month during the fall and spring academic semesters to be considered for full review on the second Tuesday of the month.

Expedited and exempt reviews can be turned in any time. For questions about the review process contact Brian Peery in Russ Hall, #112, Ext. 4175.

1. Investigator(s) Name(s): Shannon Duncan

2. Department: Irene Ransom Bradley School of Nursing

3. Local Address: 1308 Lakewood Drive Pittsburg, KS 66762

4. Phone: (620)404-8897

5. E-mail Address: slduncan@gus.pittstate.edu

6. Project Title: Increasing HPV Vaccination Rates Among Adolescents in Crawford County

7. Expected Completion Date: 11/30/2018

8. Expected Starting Date 10/25/2018

9. Is this project (check all that apply): Use review criteria in Form CR-1 to determine which category of review applies.

Application for Full Review	Protocol Change	Thesis/Special Investigation
Being submitted for external support	Continued Review	Application for Expedited Review
Being conducted in a foreign country	Faculty Research	<input checked="" type="checkbox"/> Application for Exempt Review
Publishable research	A Class Project	

10. If notification of human subject approval is required give date required: N/A

Name of agency: _____

11. If you are a student, complete the following:

Faculty Sponsor: Jennifer Harris

Department: Irene Ransom Bradley School of Nursing

Phone: (620)235-4431

**** If submitted externally, a complete copy of the proposal must be submitted to the IRB.****

CERTIFICATION AND APPROVAL

Certification by Investigator: I certify that (a) the information presented in this application is accurate, (b) only the procedures approved by the IRB will be used in this project, (c) modifications to this project will be submitted for approval prior to use, and that all guidelines outlined in the PSU Policy and Assurance Handbook for the Protection of Human Research Subjects will be followed as well as all applicable federal, state and local laws regarding the protection of human subjects in research as outlined in Form VA-1.

Bonnie J. Duman

Signature of Investigator

11/6/18
Date

Faculty Sponsor: If the Investigator is a student, his/her Faculty Sponsor must approve this application. I certify that this project is under my direct supervision and that I accept the responsibility for ensuring that all provisions of approval are met by the investigator.

J. H. Harris

Signature of Faculty Sponsor

11/6/18
Date

Department Review Committee Chair: I acknowledge that this research is in keeping with the standards set by our department, university, state and federal agencies and I assure that the student principal investigator has met all departmental requirements for review and approval of this research.

Cheryl A. Legi

Signature of Department Review Committee Chairperson

11/6/18
Date

Carol K. Kehoe

CPHRS Chairperson

11/28/18
Date

I. Description of the Subjects (If advertising for subjects, include a copy of the proposed advertisement.)

A. How many subjects will be involved? Approximately 600

B. Subject Population (check all that apply)

Adults

Prisoners

Minors

Physically Ill

Disabled

Special Education

Other

Database provided by Community Health Clinic without identifiers.
Intellectual Disability

*C. For projects conducted in schools or school settings:

(Written approval from the Building Administrator must be obtained)

What grade are the students in? _____

Approximate Age of Students? _____