

Human Papilloma Virus Vaccine: Choice or Necessity?

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Abstract

Human papilloma Virus affects sexually active individuals at some point in their life. There is no effective screening or means to prevent the spread of infection. Hence, vaccination could be a very useful tool to combat this issue. A health education intervention using posters in college can help educate adolescents about vaccinations and its benefits reinforce their decision to get vaccinated. Ultimately, we are trying to promote better health among individuals by convincing them to get vaccinated. The designed poster covers important facts from center of disease control and prevention, World Health Organization and U.S department of health and human services.

Key words: Cervical cancer, DNA virus, Genital warts, Health education, Human papillomavirus, Poster, Vaccination

INTRODUCTION

One of the most common preventable sexually transmitted diseases among adolescents is human papillomavirus (HPV) infection.^[1] Every sexually active individual at some point of time in life is affected with HPV. Based on the recent studies, HPV infection and its long-term consequences can be prevented with vaccination.^[1] Most HPV infections are cleared by the immune system, but few results in clinical sequelae. To answer the burning question on the necessity of vaccination, it should be noted that – 1 - there are no effective screening tests, 2 - there are no effective means to prevent the spread of HPV infection, 3 - individuals can spread the infection without showing any signs and symptoms of the infection, and 4 - available treatment options are not curative.^[1]

Currently, there are about 79 million individuals infected with HPV infection in the United States, 14 million adds to the total annually.^[2] Annually 11,000 women are

diagnosed with cervical cancer in the United States. At any given point of time in the United States, 10% of the population has an active HPV infection. The infection with cytological abnormalities is found in 4% individuals and 1% with genital warts.^[2] There are more than 40 types of HPV strains, and all of them are sexually transmitted. Two strains of HPV- 16 and 18 are associated with 99.7% of cervical cancers.^[3] An estimated 1.7 billion is spent annually in direct medical costs associated with HPV infections and sequelae.^[1]

The first vaccine for HPV infection was introduced in 2006. By early 2017, 71 countries have included HPV vaccination in their routine list of vaccination for girls. According to recommendations from the center of disease control and prevention (CDC) and the American Academy of Pediatrics, boys and girls at ages 11–12 should be given the HPV vaccine. Usually, two doses 6–12 months apart are given. In the case of teens starting the vaccine late around 15 years, three doses are recommended, the second dose after 1–2 months after the first dose, and third dose after 6–12 months. They are most effective when given at young age, before sexual activity and exposure to HPV. It is important to note that the vaccine is ineffective when given to those already infected. At the least, the vaccine provides protection for 5–10 years depending on the type of vaccine. 33.4% have completed the three-dose schedule of the HPV vaccine in the USA compared to the 71.2%

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in Australia and 60.4% in the United Kingdom.^[4-6] The causes for low vaccination rates of HPV vaccination in America include missed opportunities for simultaneous administration of HPV vaccine with Tdap, concern about side effects, moral or religious grounds, objection to a large number of needles, lack of access, lack of information, and language barrier.

Goal

Our goal is to plan an intervention for the protection the students from the HPV infection and its long-term effects.

LITERATURE REVIEW

In spite of being a developed country, United States still has the majority of the population who continue to get vaccine-preventable diseases. According to the CDC, 79 million women are affected with HPV. The World Health Organization (WHO) estimates that 265,673 deaths occur annually due to cervical cancer in the world. The 4th leading cause of female cancer death in the world is cervical cancer associated with HPV. Among women aged 15–44 years, cervical cancer associated with HPV is the second most common.

Virology

HPV is a double-stranded DNA virus from Papillomaviridae family. They are non-enveloped and double-stranded genome.^[7] There are 170 different types, of which 40 types are associated with common genital infections, and two types are associated with cervical cancer.^[7] International Agency for cancer research has broadly divided HPV into two types: High risk and low risk. With the link to different types of cancers (cervical, penile, anal, and throat), HPV strains 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, and 59 are termed as high-risk type. The remaining strains are generally associated with common benign conditions like genital warts and termed as low-risk type.

Transmission

Most people are affected by HPV infection at some point in their life.^[8] Risk factors for HPV infection among women include young age, risky sexual behavior (e.g., multiple sexual partners and early age of the first encounter), immune status, oral contraceptives, smoking, and poor nutrition. Most common risk factors among males include multiple sexual partners, unsafe sexual practice and being uncircumcised. Transmission of infection requires contact with a viable HPV and microtrauma to skin or mucous membrane. Few strains of HPV cross the placental barrier during the delivery to cause juvenile-onset recurrent respiratory papillomatosis.

Signs and Symptoms

Most of the individuals infected with HPV are asymptomatic. Skin infection with HPV presents itself as warts. Of the

infection individuals, 10% are present with warts. Common warts are found in soles of the feet, under the fingernails, arms, face, and forehead. Genital warts are the classical sign of HPV infection. Another common occurrence with HPV strains 6 and 11 is warts in the larynx termed as laryngeal papillomatosis. These interfere with regular respiration and recur frequently.

HPV Associated Cancers

High-risk strains are associated with cancers. 5.2% of all the cancers are believed to be associated with HPV infection.^[9] Cancer of cervix, vagina, vulva, penis, anus, oropharynx, and lung is linked to persistent HPV infection.^[10] HPV associated cancers result in 27,000 deaths in the United States alone every year.^[8] Cervical cancer associated with HPV infection resulted in 266,000 deaths and 528,000 new cases was recorded in 2012; majority have these been in the developing nations.^[11]

Vaccination

The WHO recommends HPV vaccines as a part of routine vaccine schedule along with additional cancer screenings in place. In the United States, HPV vaccines are recommended by CDC for boys ages 11–12. The main aim here is to decrease the virus prevalence within the population. It is important to note that a cost of HPV vaccine is \$200 in the United States, while it is \$40 in a developing nation.^[12] Vaccines of three types are available in the market today - bivalent, quadrivalent, and nonavalent.

Bivalent HPV vaccine

It is mainly used for HPV strains 16 and 18. The route of administration is intramuscular, containing 0.5 ml dose. It is available in 1 dose or 2 dose vials. This vaccine is indicated for girls especially for protection against cancers of cervix, vagina, vulva, and anus.

Quadrivalent HPV vaccine

It is mainly for HPV strains 6, 11, 16, and 18. The route of administration is intramuscular, containing 0.5 ml dose. It is available in 1 dose vial. It is indicated in both males and females for protection from associated cancers.

Nonavalent HPV vaccine

It is mainly used for HPV strains 6, 11, 16, 18, 31, 33, 45, 52, and 58. The route of administration is intramuscular, containing 0.5 ml dose. It is available in 1 dose vial. It is indicated in both males and females for protection from associated cancers and against benign conditions like warts.

Naud *et al.* concluded that the three available vaccines have similar effectiveness in preventing cancer.^[13] There is also evidence from the literature suggesting the success of vaccination programs. There is established evidence that there is a reduction in cervical abnormalities in females.^[14,15]

There has been reduction in viral loads recorded among males who have had the quadrivalent vaccine.^[16]

Previous Efforts Related to HPV Vaccination

Various educational measures for HPV vaccination has been put out by the CDC and American Medical Association in the recent years.^[17] For the success of any vaccine uptake understanding two important perspectives are important, physicians, and the parents. 78% of family physicians and pediatricians preferred CDC's factsheet as their medium for information for HPV vaccination.^[17] Based on recent studies factors influencing the decision-making for HPV vaccination have been identified. They include perception and beliefs of peers, physicians recommendations, communication about sexual practices.^[18] One of the efforts by the Congress to ensure protection against HPV is to pass law 106–554, which includes specific provisions for HPV vaccination.^[19] According to the Law, “ the CDC should

- Conduct sentinel surveillance and special studies to determine the prevalence of HPV in the United States.^[19]
- Conduct behavioral and other research on the impact of HPV-related diagnosis on individuals; formative research to assist with the development of educational messages; surveys of physician and public knowledge, attitudes, and practices about genital HPV infection.^[19]
- On the completion of formative research, develop and disseminate educational materials for the public and health-care providers regarding HPV and its impact and prevention.”^[18,19]

APPLICATION OF THEORETICAL FRAMEWORK

The socio-ecological model would be applied to our focus on HPV prevention and education by determining the

HPV VACCINE

Get your HPV Vaccine before ending up with preventable long-term consequences!

DID YOU KNOW?

- Every sexually active individual at some point of time is affected with HPV.
- Currently, 79 million individuals are infected with an HPV infection in the US.
- 10% of the population has an active HPV infection.
- There are more than 40 types of HPV infections- all are sexually transmitted.
- The vaccine is ineffective when given to one that is already infected.
- 3 available vaccine types: bivalent, quadrivalent and nonavalent.

SIGNS & SYMPTOMS

- MOST people with HPV are asymptomatic.
- Skin infections include warts of the feet, arms, face, forehead and under fingernails.
- Genital warts are most common sign of HPV.
- Respiratory symptoms present with HPV 6 & 11

WHY?

- This vaccine can prevent cancers related to various HPV types (5.2% of all cancers are associated with HPV).

WHAT CAN YOU DO?

GET VACCINATED TODAY!

- According to the CDC, Boys and girls should get the vaccine ages 11-12 which requires only 2 doses (6-12 months apart).
- Can still get vaccinated at a later age (Under 27) even if sexually active. Usually 3 doses (second dose 1-2 months after the first, third dose 6-12 months after second.)

St. John's University, Facts provided by CDC, www.cdc.gov/hpv

Figure 1: Poster educating students about HPV vaccination

environmental and personal factors that influence one's behavior. In this case specifically, we are focusing on the intention to get the HPV vaccination done after being provided with all necessary information. By determining behavioral factors at multiple levels, we can promote healthier choices and bring awareness to the young population from a community level specifically.

This model is based on a multilevel intervention. Since we are targeting college students we are focusing on how providing the knowledge on HPV will initiate them to get the vaccination done and/or find out more to ensure they are making a correct decision. This intervention originally has five levels including individual, interpersonal, institutional, community, and policy. We will now cover how each of these levels can be applied to this program intervention [Figure 1].

Individual Level

Educate college students, ideally students who did not get vaccinated at the target age of 11–12 years old. These individuals will have the ability to gain the information needed through posters to carry out their decision to get vaccinated. The effectiveness can be affected by demographic factors such as age and gender, social determinants, and more.

Interpersonal Level

At this level, students will need to be reassured to complete the vaccine or see the benefits of getting the vaccine done to eliminate preventable HPV related illnesses. The need for the vaccine is most important in this level. The vaccine will eliminate future diseases as well as certain cancers related to the HPV infection. Individuals can obtain this information from their PCPs, on-campus medical center or available clinics in the area.

Institutional/Organizational Level

At this level, the providers will need to carry out the vaccination and follow-up to ensure the entire series is completed. Providers can educate individuals more thoroughly on medical facts regarding HPV that was not mentioned in detail on the posters.

Community level

Public education campaigns on HPV long-term consequences, highlighting prevention through the use of vaccines and guiding the importance of completing vaccines even after target age and/or is already sexually active. The health message will be provided through posters on the campus for a 1 month period. Other modes of communication may include the radio, television, newspapers, and social media. These young individuals may not have any previous knowledge of this topic, therefore, leading to low vaccination rates.

Public Policy Level

Federal Legislation will ensure providers are meeting the criteria to share this information as well as carry out process of vaccinations. Managing resources should also be a main priority. Providing individuals with free health clinics or insurance coverage will allow teenagers or those who are not as financially stable to not make the cost of the vaccine a negative factor. The government can also provide funds to schools to increase health education on HPV as well as provide vaccinations.

HEALTH COMMUNICATION METHOD

To get this health message across, posters were developed which covered important facts, signs and symptoms, importance of the vaccine as well as ideal age requirements to get HPV vaccines done. This message was provided to motivate members of the college to engage in HPV education. A college campus was selected as the setting of this study because it is convenient to portray this information to students where they are most available. Even if one is making their way across campus they still have access to this information. To provide accurate information to the public, we will rely on organizations such as the CDC, the WHO, the U.S department of health and human services, and other local stakeholders. These posters are accessible to large group of individuals within the age range for the vaccination.

Others modes of communication include the radio, newspaper, videos, PSAs, and more. Once the effectiveness of the posters are determined other modes of communication can be used in the future to help aid this process or reach those who are not on campus as often. Important factors when developing the poster included using colors that will attract the audience, keeping facts informative and concise, reducing the use of jargon, providing answers to most common questions as well as presenting other resources where these students will be able to get more information. We determined that focusing on a community level will incorporate more of the population as stakeholders for possible programs or better outreach in the future.

DISCUSSION

HPV vaccines are important measures of prevention; however, there are many factors that can influence one's decision on whether or not to get the vaccine. These factors may not be related to teen education which is our main approach in this intervention. For instance, parents may not have access to the same education which would influence them to get their children vaccinated younger. There may also be fear or stigma of promoting sexual activity by allowing their children to get this vaccine. In addition, the fear of

getting the vaccine done itself and whether there will be any negative effects associated with it may influence one's decision as well. Socioeconomic status may also influence whether one has access to these materials and transportation costs may also hinder their ability to complete the vaccination series.

We are hoping to encourage better decision-making among adolescence when it comes to their health. We are providing all necessary information or requested information relating to HPV as well as promoting the services already accessible to students. With access to all of these materials, the vaccination rates should increase. If this program is deemed as successful among this university, it can be applied to other schools to increase awareness and vaccination rates overall. We hope to continue this process, therefore, making HPV education and vaccination routine in each population. The more the community works together, the easier it will be to disperse this health message. Involving group leaders or other key stakeholders such as teachers, caregivers, media, and religious associations will help expand on the importance of the topic.^[20, 21]

CONCLUSION

HPV is one of the most common preventable sexually transmitted diseases among adolescents; however, it is preventable with the use of the vaccine. According to the WHO, HPV vaccination report, "cervical cancer, caused by sexually transmitted HPV, is the second most common cancer in women worldwide and results in about 266,000 deaths each year." We hope to target the population that missed their opportunity to get vaccinated at a younger age due to lack of health education on HPV. The importance of this proposed plan is to determine if providing this information to adolescents who still have a chance to get vaccinated will indeed increase vaccination rates.

Posters are a common way of sharing details about important health issues. Our goal was to raise vaccination levels among students. To promote vaccinations, we aimed to reinforce these decisions made by students to prevent HPV related illnesses. The proposed study findings may be useful if applying posters to other universities in addition understanding what needs to be improved for better results.

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