College Females Beliefs, Attitudes, and Experiences Toward Gardasil and the Human Papillomavirus

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Introduction

On June 8, 2006 the United States Food and Drug Administration (FDA) approved the quadrivalent Human Papillomavirus (HPV) vaccine that was produced by Merck and Co. Inc that protects against four strains of HPV (Huang, 2008). Since this time there has been talk in several states of making this vaccine mandatory for females as early as the sixth grade. The idea of mandating this particular vaccine has caused some controversy because if this vaccine were to become mandatory it would become the first mandatory vaccine to prevent a Sexually Transmitted Infection (STI) (Vamos, McDermott, & Daley, 2008). However, there are now many women in the recommended age range to get the vaccine that would not be mandated to do so because they are no longer in elementary or secondary schools where getting vaccinated might be required. Females in their late teens and in their early 20s are not affected by this mandate so it is of interest to see if they are aware of HPVs consequences and if they know about Gardasil. There is little information about the effects of vaccination rates in a population that is not required to get the vaccine and this research will look at a particular group that is recommended to get the vaccine, but is not required to do so.

Yet, opponents of mandatory vaccination feel that the government should not be the ones to socialize children about sexual activity. If the government mandates that all females in the age range between 9-26 years old get the vaccine, some individuals feel that the government may be promoting early sexual behavior or experiences. Opponents feel their knowledge of being protected against HPV may lead young girls to think they are protected against other STIs. Mandating that females should get vaccinated against a sexually transmitted infection may cause young girls to think about sexual activity earlier than if they did not get vaccinated against a STI. However another issue can arise if children can be protected against a disease but are not and then later suffer serious health issues later on in life or even early death. Whether to vaccinate or not is an issue that parents and young adults could potentially wrestle with. Females who are already in their late teens or early 20s need to make this decision for themselves and since this vaccine was not available when their parents were making decisions as to whether or not to vaccinate them, young women are in a unique position. As a result, researchers can examine what motivates young women to decide to be vaccinated against a STI. Many
vaccinations that are for adults are not mandatory. It is interesting to find out what would cause individuals to get vaccinated if they have a “choice” versus if they were “forced” by their parents or if mandated by the government.

Proponents of the vaccine feel that if the vaccine is available to young children they will be protected against HPV before they are exposed to it. The key to prevention is to protect individuals at risk before they contract the virus. So even if girls are not sexually active until their late teens or early twenties they will be protected from a possible STI. These issues together may make it seem that mandatory vaccination is against parental and religious choices in regard to medical and sexual behavior (Vamos, McDermott, & Daley, 2008). However, the goal of making Gardasil mandatory is not to prevent parents from making decisions for their children or to promote sexual activity, but to help prevent the spread of a needless infection and potential cause of cancer. Young women who are old enough to make their own decisions as to whether to vaccinate themselves against HPV or not are making the decision not based on a requirement but for themselves. They are not being forced to get vaccinated against HPV as a requirement for school, but they may be influenced by the recommendation to get vaccinated or may be affected by the beliefs of their parents. But they also know what theirs sexual activity level is and may feel that they are at risk of getting HPV. Females in their teens and early 20s now did not have the opportunity to be protected against HPV from an early age. So by looking at females in the college setting it is possible to find out if getting vaccinated against HPV is important to them and what are the possible reasons to explain why they want to get vaccinated.

One goal of this research is to investigate why females in the college setting opt to, or decide not to, get vaccinated against HPV. It is also of interest to find out what these female college students are talking about—are they worried about getting HPV or cervical cancer, and with whom are they talking about these topics? Are they worried about possible negative side effects from the vaccine? There are certain motivations that drive a female college student to protect herself against HPV and this research aims to uncover potential reasons (i.e., motivations) for engaging in protective behaviors (e.g., in this case, the decision to get vaccinated against HPV). There is little other research in the
literature that studies females in the college setting regarding Gardasil; and this research will help bridge that gap.

**Thesis Statement**

The Health Belief Model will be used to frame this research in an effort to help the scientific community understand the reasons why females choose to or choose not to get the Gardasil vaccine. Motivation is a key component to decision making, so this model will help explain females’ motivation toward inoculating themselves with Gardasil. This research, with the use of the Health Belief model, will shed light on the question “What motivates females to get the Gardasil vaccine”

**The Human Papillomavirus**

The Human Papillomavirus (HPV) is the most common sexually transmitted infection in the United States. Currently, approximately 20 million Americans are infected with HPV with 6 million new people infected each year. At some point in sexually active men and women’s lives 50% will have had HPV. There are over 100 strains of HPV that can infect the genital area, the mouth, and/or throat of both males and females (Centers, 2009) (van der Snoek, et al., 2003). It can cause both genital warts and cervical cancer (Vamos, McDermott, & Daley, 2008). The new vaccine Gardasil can prevent four strains of HPV -- 6, 11, 16, and 18. These strains of HPV can not only cause genital warts and cervical cancer, but can also cause vulvar and vaginal cancer (U.S. Department, 2009).

In 90% of HPV cases most people do not develop symptoms or health related problems. In these cases, the body’s natural immunity clears the infection up within two years. However, if the body does not resolve the disease HPV can cause genital warts in both males and females. Infrequently, HPV can cause warts in the throat as well causing a condition called Recurrent Respiratory Papillomatosis (RRP). This condition can block the airway and can cause trouble breathing or a hoarse voice. Approximately less than 2,000 children get RRP in the US every year. RRP can be treated with surgery or medicines (Centers, 2009).

Certain strains of HPV are not self-correcting (i.e. with self-correcting strains the body naturally rids itself of the virus) and can cause cancer. Most commonly it can lead to cervical cancer. However, it can lead to other cancers of the vulva, vagina, penis, anus,
tongue, tonsils, and throat. There is no way to find determine if someone who has HPV will develop warts or cancer.

Genital warts look like a small bump or groups of bumps in the genital or throat area. They have many different sizes and shapes, small, big, elevated or smooth or shaped like a cauliflower. They can be diagnosed by going to a health care provider. These warts can appear within a wide range of time after sexual contact- either weeks or months, even if the infected partner had no signs or symptoms. If they are not treated, they may go away or they may increase in size or number. Individuals will not get cancer from the genital warts however. HPV causes normal cells on the body that are infected to turn abnormal. Typically, you cannot see or feel the changes, and like stated previously the body usually just fights the virus off and the cells go back to normal; but when the body does not fight it off, there could be visible changes which can happen within weeks or months of getting HPV. Approximately 1% of sexually active US adults have genital warts at one time. Treatment for genital warts is to take medication or to leave them alone and see if they disappear on their own (Centers, 2009).

Cervical cancer is hard to recognize early because it usually does not have signs or symptoms until it is in an advanced state. The only way to test for cervical cancer, at this point in time, is to get an annual screening from a doctor. These tests can detect problems early before there are symptoms and may prevent HPV from turning into cancer or prevent the cancer from advancing. The other cancers that can result from HPV frequently do not have signs or symptoms until it is very advanced (Centers, 2009). The greater risk for sexually active individuals to contract HPV leads to a recommendation to get screened and tested for sexually transmitted infections regularly. When HPV causes cancer, it usually takes years to develop. Annually, in the United States 12,000 women get cervical cancer, 3,700 get vulvar cancer, 1,000 get vaginal cancer, 1,000 men get penile cancer, 2,700 women and 1,700 men get anal cancer, and 2,300 women and 9,000 men get head and neck cancer from HPV. Cervical cancer treatment is best when found early through Pap tests and follow ups with health care providers (Centers, 2009).

The transmission route for HPV is through genital contact, usually during vaginal and anal sex, but it may also be passed through oral sex and genital-to-genital contact, even when there are no signs or symptoms. Most people with HPV do not know that they
have it and do not know they are passing it on to their partners. In very extreme cases a pregnant woman with genital HPV can pass it onto her baby during delivery and this can develop into RRP. Gay, bisexual men, and those with weakened immune systems are more at risk for getting HPV related health problems. More specifically, individuals with weakened immune systems can more easily catch infections and/or diseases. Gay and bisexual men who engage in anal sex may be susceptible to these HPV strains because they can easily infect the basal layer of the epithelium of the anogenital tract and therefore increase cell proliferation and viral replication in the body (van der snoek et al., 2003).

There are many ways for individuals to protect themselves against HPV. As of now there is the vaccine Gardasil that can protect both girls and boys from ages 9-26 years of age, and there is Cervarix for girls of the same age group. Both HPV vaccines are comprised of three dose shots given at month 0, 2, and 6. When getting the second and third dose it is best to get the same vaccine brand as the previous dose (Centers, 2008). When people are sexually active it is important to use condoms to decrease the risks of developing HPV, however, HPV can be spread to areas that are not protected by the condom. Alternatively, the other option to prevent contracting and transmitting HPV is to be in a committed relationship with a partner who does not have HPV or by limiting the number of sex partners that you have. The only test to detect HPV on the market is the screening test for cervical cancer (Centers, 2009). This makes it difficult to find out if someone is spreading the disease or if they may experience symptoms of HPV in the future.

Females’ attitudes, beliefs, and experiences toward Gardasil are important to study because it is the only vaccine available to prevent cancer. Along with the approval by the FDA to vaccinate boys against HPV, the four strains of HPV can be eliminated and many cases of genital warts and cancer can be prevented. It is also important to study HPV and Gardasil because there is controversy surrounding it including moral, religious, political, economic, and socio-cultural aspects (Vamos, McDermott, & Daley, 2008). For example, opponents of the HPV vaccine, based on moral and religious grounds, believe that sex should occur within the confines of marriage and hence, any sexual activity outside of a marital bond is frowned upon. If a vaccine is promoted to prevent HPV,
individuals may not adhere to the same moral or religious standards with regard to their sexual activities. There are political and economic controversies because Merck and Co. is making millions of dollars from their Gardasil vaccine and they can support candidates that might mandate the vaccine to help Merck and Co. make even more profits. Also, economically and socio-culturally it is controversial because the vaccine is expensive and is a three dose shot that everyone cannot afford, especially if they do not have health insurance. However, most insurance plans do cover the vaccination which can cut down on the barrier of cost to many females, especially since new laws are being enacted requiring all people to have health insurance. Any female engaging in sexual activity is at risk of contracting HPV and the disease could ultimately progress into cervical cancer and die. However, if HPV could be prevented from being transmitted, with the help of a vaccine it could prevent many premature deaths.

**Vaccination Pros**

Even with all of the controversy, there are major benefits to this vaccine (e.g., prevention of cervical cancer and genital warts). The four strains of HPV that are present in the vaccine are HPV-6, 11, 16, and 18 (Huang, 2008). These four strains could prevent up to 70% of cervical cancer cases and 90% of genital wart cases (Vamos, McDermott, & Daley, 2008). The percentages of diseased cases that could be prevented with Gardasil are substantial and could prevent the loss of health in many women while also dramatically cutting down on medical costs. The positives to the vaccine have been accepted by many women. As of January 1, 2010; twenty-eight million doses of Gardasil were distributed in the United States (Centers, 2010).

Until recently another issue regarding the Gardasil vaccine was the fact that it was only approved for use in females. Before October of 2009, the CDC only recommended that women between the ages of 9-26 be vaccinated; with no equivalent vaccine for men of any age available. However, on October 16, 2009 the FDA approved Gardasil for men between the same age range as women—9-26 years of age. With this new approval men and women can both prevent the spread of HPV and prevent even more deaths from cancer caused by the four strains of HPV (U.S. Department, 2009). With this new recommendation, more people may know about HPV and the vaccinations available. People can then make the choice to inoculate themselves to prevent the disease if they
feel that they are at risk. Also, with this new recommendation it may help spur more conversations about STIs and let people know the ways they can protect themselves.

**Vaccination Cons**

Along with the benefits of the Gardasil vaccine there have been some adverse affects associated with getting the vaccine (e.g., non-serious side effects from the vaccine, which have accounted for 92% of all adverse events). More specifically, some women have fainted, experienced pain and swelling at the injection site, headache, nausea, and fever. Another 8% of the side effects have been serious adverse events such as Guillain-Barre Syndrome (GBS) after getting the Gardasil vaccination; however, this only occurs in about 1-2 out of every 100,000. GBS is a form of acute flaccid paralysis and symptoms include weakness, sensory abnormalities, and autonomic dysfunctions. The underlying cause of the disease is not completely understood, but it is believed that immune stimulation plays a role in its cause and that immunizations may be associated with the disease (Haber, Sejvar, Mikaeloff, & DeStefano, 2009). There have also been reports of blood clots after receiving Gardasil, with most people having had a higher risk of getting blood clots before receiving the vaccination. Finally, there have been 49 deaths after females have gotten the Gardasil vaccine. Twenty-Eight deaths have been confirmed and 21 are unconfirmed because of no name or identifiable patient information to authenticate the relationship between the deaths and Gardasil. There are no unusual patterns or clustering that would suggest that the deaths were caused by the vaccine (Centers, 2010).

**Controversies**

It has been stated that there are both advantages and disadvantages to getting vaccinated against HPV. When women weigh both the pros and cons they should be able to make an informed decision for themselves to decide if getting vaccinating is the best choices for them. However, women can also look at the big picture and see if it is worth vaccinating themselves to eradicate the infection. Some controversies have arisen because not everyone sees the possible benefits to the vaccine and others do not see the possible adverse effects. This information relates to Gardasil being the first sexually transmitted infection vaccine mandatory for entrance into schools. Other mandatory vaccinations only prevent diseases that are spread more commonly through indirect
means such as touching a germ infected object, or being coughed on by someone who has the infection. Some of those diseases are measles, chicken pox, and polio (Vamos, McDermott, & Daley, 2008). This infection, HPV however, is not highly transmittable through indirect means or through such things as coughing. Its main transmission is through sexual contact, and is highly preventable by not engaging in sexual behavior with a partner infected with HPV. With this in mind, mandatory vaccination opponents feel that it would promote promiscuity and could be morally wrong, especially since the recommended age range to receive the vaccine is 9-26 years of age (Vamos, McDermott, & Daley, 2008). Most people believe that children as young as 9 years old should not be having sex and feel that this may give children early sexual thoughts. However, the idea of vaccinating children at this young age is to protect them before they can be exposed to the virus. The vaccine would not be effective it were targeting people who have already been exposed to the infection.

Much of the research already available about HPV and Gardasil has to do with whether or not Gardasil should be mandatory for young girls as early as 9 years old (Vamos, McDermott, & Daley, 2008). This research however, will look towards young adult women and their reasoning as to why or why not they have chosen to get vaccinated against HPV. Hopefully this research will highlight some of the reasons why young women decide to get vaccinated, without the compulsory HPV vaccination (i.e., without schools requiring it). This is important because voluntary participation will lead to more positive feelings toward the activity in which the person is involved (van der Velde & Feij, 1995). It has also been found that when patients are well informed on their health decision they are more satisfied with their decision (Deyo, 2001). If patients are fully aware of how getting the vaccine will benefit them then they will be more likely to be happy with the result. This information is interesting to look at because many states are thinking about or have already imposed laws that require girls to get vaccinated before a certain age. This can cause people to rebel against the vaccine and not support it because they may feel that they have no choice. However, if it is not a requirement and only a recommendation and educational materials are made available to the public about the benefits to the vaccine, more people may feel inclined to willingly vaccinate themselves and have more positive feelings about their health choice.
As stated previously some states have looked into making Gardasil mandatory. In the state of Texas, in September 2008, all girls were required to be vaccinated against HPV with Gardasil before they could enter the sixth grade. This has caused some controversy because the Governor of Texas, Rick Perry, received funds from Merck and Co., the maker of Gardasil. The Governor claimed his support from Merck and Co. had nothing to do with Gardasil being mandatory in the schools. He said that his decision was based on the positive health outcomes that would result from the vaccinations and the recommendations from the Centers for Disease Control and Prevention (2007). This adds another dimension to the Gardasil controversy – monetary incentives. In other words, Perry’s decision was predicated on the notion of protecting young women against a sexually transmitted infection; however, because he received funds from Merck, his intentions are now questioned (i.e., monetary gains for himself). All makers of vaccines are going to receive monetary gains when their vaccine is used, but that should not be the only reason to mandate a vaccine for entrance into school. The number one reason vaccinations should be mandatory, should be to prevent the spread of disease. Another aspect of the debate is should this vaccine be added to the childhood vaccine schedule and be required of students for school admission. HPV is unlike the other recommended childhood vaccines, in that HPV is transmitted via sexual activity. Also, HPV could lead to cervical cancer, but the disease progression is delayed for roughly 10 – 15 years. In other words, with other disease/ infections, the potential deleterious effects are more immediate when compared to those of HPV and/or cervical cancer. Hence, the question is whether women should decide for themselves whether they want to take the risk of getting HPV or cervical cancer or should the government make a decision they believe is in the best interest of women? Should the government instead focus on educating women about the risks of HPV so that they will voluntarily vaccinate themselves to protect themselves? However when vaccines are not mandated such as adult vaccinations for tetanus, influenza, and Pnumococcus, the rates of vaccination are extremely low. With this in mind as well, no one likes to be told to do something and using the term mandate makes it seems like there will be threat of force if not followed through (Wynia, 2007). To get a large base of the population to feel like they are doing something to protect their own health would be to let people decide for themselves whether to get vaccinated or not;
in other words, to let individuals see how it would be in their best interest to do so. If people are getting vaccinated on a voluntary basis, with the necessary education about who is at risk and who needs to be vaccinated, those who would most need the vaccine could get it. This disease HPV, is not on the same level as other mandatory vaccines, such as measles and small pox, because it is only passed through sexual contact and would be much harder to get widespread approval to be mandatory (Roll, 2007).

The age at which young women will have a greater chance of coming into contact with HPV and having to make the decision to vaccinate themselves is in the college years (i.e. 18-24 years of age). This age range could become especially susceptible to catching HPV because college can be a time of experimentation and exploration for many young women. With this in mind, college females might engage in riskier activities that other age groups would not. In one study, researchers have found that 42.9% of college age males and 49.7% of college age females have had sexual intercourse in the past month. It was also found that 30.1% of males and 28.9% of females in college reported having 4 or more partners in their lifetime (Page, Hammermeister, & Scanlan, 2000). McDonald et al. (1990) found that consistent condom use for men was 24.8% and 15.6% for women in the college setting. The results indicate that college students are having sex and may be susceptible to contracting HPV. When they are having sex they may be having it with a person who has had multiple partners and may have HPV and not know it. This project will help examine if women who are sexually active are taking precautions to protect themselves against the Human Papillomavirus. This is of serious consequence because if women in their late teens and early 20s get HPV they will have to endure the disease for the rest of their lives, and deal with the health problems that may result. However, young women can protect themselves against HPV with Gardasil. From current findings, according to the CDC, the effectiveness of the vaccine will last a long time, however they are unsure if there is a time limit on the effectiveness. There is more research being done to see if a booster shot will be needed in the future. Also, it is not known if only getting one or two of the shots are of value, so it is important that females get all three shots in the series for maximum protection (Centers, 2008).

Not only could this cut back on disease maintenance and having to deal with not spreading HPV to a partner, it could reduce medical costs. The Gardasil vaccine costs
$125 per dose and three doses are required for a total cost of $375, with most insurance plans covering the vaccination (Centers, 2008). This cost could be much less than the maintenance for genital warts or the cost of treatment for cancer. Especially with the new health care reform, which will hopefully cover all Americans with health insurance, the cost of the vaccination would be of no concern to those getting the vaccine. Today, many college students are still covered under their parents’ insurance plans. Since most insurance plans now cover Gardasil, and this research is looking at females at Miami University where having health insurance is a requirement to go to school, it may make getting the vaccine easier for these students because they already have health insurance. This population does not have to think about the cost of vaccination in their decision making process because they have insurance to pay for the vaccine.

On the other hand even though this vaccine can prevent 70% of cervical cancer cases it only affects a very small percentage of the United State’s population. So if the government were to mandate the vaccine, it would only affect a small proportion of people (Dowling, 2008). There could possibly be females vaccinated that will never encounter HPV, but the only way to protect the entire population is to vaccinate everyone at risk. However, cervical cancer is the second leading cause of death due to cancer worldwide, killing 240,000 women each year, with almost a half-million diagnoses annually (Cook, 2008). This may be a small percentage of overall deaths, but it would reduce a large percentage of deaths due to cancer. Since in the future all Americans should be covered by health insurance there would be a greater benefit to those that were previously uninsured because they might not have been as well educated and might not have known about the dangers of HPV. Now, they will have the chance to get vaccinated by having their insurance pay for it.

Young college students are in a different developmental, social, financial, and cultural situation than younger students because they are in a new life stage and are expected to be more responsible for their well being in all aspects of their life. However, Arnett (2000) says that they have few responsibilities to worry about and are exploring and figuring out the here and now rather than worrying about responsibilities. College students are beginning to grow up and make decisions for themselves without having to rely on their parents or other adults for all of their life choices. They may still rely on
their parents for some of their financial needs, but their parents may not know what their finances go toward, or they may have their own job and use their money any way they see necessary. This is not true of younger children whose parents are aware of their choices. College students are in a new stage in their life where they do not have to check in with anyone but themselves because they are on their own. However, with younger children who are still in elementary or high school they have to make all of their choices based on what their parents allow. Also, college students are immersed in a culture where they are around almost only other college students. This may influence their decision making because they may want to protect themselves from situations such as having sex with someone who may have HPV because they know it is a possibility. Arnett (2000) says that the age range of 18-25 years old is a stage of emerging adulthood. There is relative independence from social roles and from normative expectations. Emerging adults are no longer relying on child qualities, but do not yet have to have all of the responsibilities of being an adult. The future is still uncertain for many and there is much exploration left for these emerging adults than for any other age group (Arnett, 2000). With this life stage they are exploring more and learning how to be responsible adults, but have not yet learned everything. Since this population of subjects, female college students, is in the emerging adult stage they are important to study because they are solely making the choice to vaccinate themselves against HPV. They are no longer told to do so because it is required for school and they are no longer required to because their parents make them get it along with all the other vaccinations they received when they were younger. College females can take control of their health by either choosing to find out all of the available information to fit their needs, or by choosing not to be educated on the subject of their health. Yoder (2002) says that there is information available to society and that gives people a greater chance to control their health and to stay healthy rather than sick, but that also can blame the individual if they get sick because they did not take the necessary precautions. This information will look at the college female to see if they are ready to be motivated by the positives of getting vaccinated to stay healthy or find out if that is not important to them. They may be looking at the available information and making the choice to be proactive about their health by protecting themselves with the Gardasil vaccine.
The Health Belief Model

So far the controversies surrounding HPV vaccinations to protect females have been discussed as well as the positives and negatives. Next, the use of the Health Belief Model (HBM) can help explain college females’ behavior in regard to HPV prevention. The HBM has been researched in the past on many topics and researchers have gained knowledge about health topics frequently by examining individuals’ behavior toward vaccinations and prevention programs. In particular it has been used to look at Hepatitis A vaccination rates of men who have sex with men (MSM), at HIV prevention programs, eating habits among college students, and colorectal screenings. This research, along with many other examples helps illustrate the motivation behind individuals’ actions. This model seeks to find people’s perceived benefits, perceived barriers, perceived susceptibility, perceived severity, perceived self-efficacy, and cues to action regarding a particular health behavior (Rosenstock, 1974). If females see high benefits, low barriers, high susceptibility, high severity, high self-efficacy and many cues to action towards Gardasil, then females will be more likely to get educated about HPV and get vaccinated with the Gardasil vaccine. In general, the HBM has been used to explore individuals’ motivation behind a behavior and what causes an individual to change a behavior.

The Health Belief Model was developed in the 1950s to explain why prevention programs were not being fully utilized (Hochbaum, 1958). Rosenstock, in the 1970s, used the Health Belief Model to find how people use health services (1974). He looked at many studies and surmised that people use health services when they have high perceived severity, perceived susceptibility, perceived benefits and low perceived barriers. People use health services when they are easiest to obtain. Behavior change would come about when people had the ability to change and saw the benefits to changing. He stated that usually those most likely to use preventative services are younger to middle aged people, females, those who are better educated, those with higher incomes, and whites. Rosenstock (1974) noted the poor were less likely to get immunizations even when free, were more likely to be in the hospital, and on average had longer hospital stays. This could be because they fail to get preventative treatment. In general at Miami University, students tend to be in the middle to upper class of socio-economic status, are better
educated, and our sample is comprised of young females. Therefore, based on
Rosenstock’s findings we posit that females at Miami should likely be vaccinated against
HPV.

This information relates to this study of Gardasil because we are looking at how
people use the Gardasil vaccine and what motivation they have to get the vaccine. It has
been found that the HBM is most successful when studying prevention programs such as
immunizations or screening programs. This is true because it does not involve a lifestyle
change (Fulton, Buechner, Scott, DeBuono, Feldman, Smith, & Kovenock, 1991). If
people do not have to change the way they live their life to prevent a health problem they
will be more likely to do it because it is easier than having to change their lifestyle. Since
this research aims to study immunization against HPV, this model was a good guide
because we are not attempting to find out if people are changing their lifestyle. We can
find out if women have the motivation to get vaccinated instead of solely focusing on
only changing their sexual activity.

HBM has also been used to examine the motivations people need to engage in
healthy behavior. For example, Chew, Palmer, & Kim (1998) found that viewing a
healthy eating television program seemed to improve efficacy, health motivation,
salience, confidence in information, and nutrition behavior. Chew, Palmer, & Kim (1998)
found that when respondents were concerned about their health and what they ate,
healthy nutritional behaviors followed. My study wants to find out if females are
concerned about their sexual health, and if they are, will they follow that concern by
protecting themselves from HPV with Gardasil. Additionally, The Health Belief Model
has been used to find predictors of women getting a breast cancer screening. Fulton et al.
(1991) found that perceived benefits and barriers to mammography were more predictive
of screening to prevent breast cancer than perceived susceptibility or perceived severity.
With this in mind we will see in our research if perceived benefits and perceived barriers
are more predictive of getting the Gardasil vaccine than perceived susceptibility or
perceived severity. Another research study looked at the relationship between The Health
found that increasing perceived benefits, perceived susceptibility, perceived severity, and
perceived self-efficacy, and cues to action and decreasing perceived barriers at the same
time would encourage participants to engage in attending an Osteoporosis Orientation Class, to participate in a Supplement Class, and to attend an Exercise Class. These findings match with the research that we are doing for Gardasil. If there is increasing perceived benefits, susceptibility, severity, self-efficacy, and cues to action, and low barriers, then females would participate more in getting the vaccine to protect themselves against HPV.

Researchers utilized the HBM to study potential motivators of older adults toward getting vaccinated with the influenza vaccine. Nexoe, Kragstrup, & Sogaard (1998) found that the HBM can predict the acceptance of influenza vaccinations. The researchers wanted to see what the important factors are for the elderly when it comes to getting flu vaccinations. Nexoe, Kragstrup, & Sogaard found that the three dimensions--perceived benefits, perceived barriers, and perceived severity were all highly significant and could predict whether or not someone would get vaccinated against influenza. These dimensions are all predictors of motivation. If perceived benefits and perceived severity are high and perceived barriers are low then people would be more likely to follow through with the health behavior. This was the case with the elderly, when benefits and severity were high and barriers were low, they were more likely to get vaccinated against the flu. They also said that people who believed influenza to be more serious and the vaccine to be more effective got the vaccine (Nexoe, Kragstrup, & Sogaard, 1998). This relates to young women and the Gardasil vaccine because if they see high perceived benefits and perceived severity and low perceived barriers then they will be more likely to get the vaccine.

HPV is a disease mainly transmitted through sexual activity, so for a woman to protect herself against HPV she will have to have high perceived benefits to want to get the vaccination to prevent HPV. *Perceived benefits* are in regard to a person’s belief as to the value or usefulness of a new behavior in their life or in decreasing a current behavior that could increase their risk for developing a disease. People are more likely to adopt a new behavior when they think it will decrease their risk for developing a disease. In the case of HPV if people believe that getting the three dose shot of Gardasil will reduce their risk of getting the Human Papillomavirus and for getting cervical cancer they will be more likely to get the vaccine.
**Hypothesis One:** The more benefits a woman sees from getting the vaccine the more likely she will be to get it.

People need ease in their life, adding one more necessity before having sex can prohibit women from listening to the precaution. So the less barriers women see in regards to protecting themselves from getting HPV or cervical cancer the better. *Perceived barriers* are women’s regard to the obstacles in their way of performing a behavior. An example of a barrier could be cost, time, or inconvenience (Chew, Palmer, & Kim, 1998). This is the most significant construct in determining a behavior change. If a person believes there is something in their way of getting the Gardasil vaccination such as it is too expensive, or they don’t have insurance, they are less likely to get the vaccine.

**Hypothesis Two:** The fewer barriers women have toward getting the Gardasil vaccine the more likely they will be to get the vaccine.

*Perceived Susceptibility* has been used to encourage people to adopt a healthier behavior. When people believe they are at risk for a disease they are more likely to take an action to prevent it. When people think they have a low risk or are not at risk for something then they are less likely to take action and unhealthy behaviors tend to take place. It has been shown that an increase in perception of susceptibility will result in healthful behaviors and a decrease in unhealthful behaviors. If women think they are more susceptible to getting HPV and cervical cancer because of their behaviors, they would be more likely to get the Gardasil vaccine.

**Hypothesis Three:** The more susceptible a woman feels that she will get HPV the more likely she will be to get the Gardasil vaccine.

Perceived susceptibility and perceived severity function together to form the construct women’s readiness to act (Chew, Palmer, & Kim, 1998). If both susceptibility and severity are high then a woman would have a higher readiness to act. She would be more willing to get the HPV prevention vaccine Gardasil in this situation.

When women are contemplating the possibility of them getting a disease/infection they are thinking about the severity of that disease or infection. If women think that HPV and cervical cancer are severe then they would be more likely to get the Gardasil vaccine. Severe to women may mean possibility of death, or the possibility of passing it on to another person. The severity of the disease may be different to different women.
Perceived Severity could be based on medical information or knowledge regarding a certain disease, or it could be based on if the person had the disease the difficulties it would have or the effects it would have on their life. For example, if a person has another sexually transmitted disease they may think getting HPV will be more severe and would be more willing to get the Gardasil vaccine to prevent getting HPV. Perceived severity is related to perceived susceptibility. If a woman is more susceptible to a disease then she would need to worry more about the severity of it. If a woman is not susceptible to HPV or cervical cancer, then she would not be as worried about the severity of that disease.

Hypothesis Four: The more serious a woman perceives the disease to be the more likely she will be to get the vaccine.

Perceived Self-efficacy is a person’s beliefs in their ability to perform some action. So if someone thinks that they can get the vaccine that prevents HPV, then they are more likely to get Gardasil. Perceived benefits and perceived barriers work in relationship with perceived self-efficacy. If there are high benefits to getting Gardasil, such as a reduced risk of getting cervical warts and cervical cancer, and low barriers such as a woman has health insurance that will pay for the vaccine and she will not have to pay for it, she will believe that she is capable of getting the vaccine.

Hypothesis Five: The more able she feels she can get the vaccine, the more likely she will be to get the vaccine.

Cues to Action are important in suggesting to women that they should protect themselves against HPV and cervical cancer. If women do not think about the risks of getting HPV or of getting cervical cancer then women may not protect themselves. Some examples of cues to action are a doctor’s advice, advertisements, or a movie that encourages preventative health behaviors (Chew, Palmer, & Kim, 1998).

Hypothesis Six: The more cues to action in a woman’s life the more likely she will be to get the vaccine.

In one study about vaccination of pneumococcal infection, researchers found that one of the main reasons that people did not get vaccinated was because they were unaware that it existed. This accounted for 77% failure rate towards vaccinations (Kyaw, Nguyen-Wan-Tam, & Pearson, 1999). If women talk about the infection of HPV they can become more aware of the available ways to protect themselves.
**Hypothesis Seven:** The more people with whom a woman talks to about HPV, and Gardasil; the more likely she will be to get Gardasil.

Vaccinations can protect the population from many infections. In one study researchers looked at the pneumococcal vaccination and the rates at which people choose to get the vaccine. For 85% of the people who decided to vaccinate themselves against this infection their motive to vaccinate themselves was because of the advice from their general practitioner. They also found that 15% of the people did not get vaccinated against the infection because they did not receive a recommendation to get vaccinated from their general practitioner (Kyaw, Nguyen-Wan-Tam, & Pearson, 1999). People look to their doctor for advice and recommendations to stay healthy and to make healthful choices.

**Hypothesis Eight:** If women talk to their doctor about the vaccine they are more likely to get vaccinated against HPV.

This study uses the Health Belief Model to study potential motivators for females in the college setting to voluntarily choose to get vaccinated against HPV and to protect themselves against cervical cancer with the Gardasil vaccine. This study surveyed 81 female college students about their knowledge of HPV, cervical cancer, and Gardasil, if they had received the vaccine or not, if they had talked to others about these issues, if they had talked to a health practitioner about these issues as well as other topics about HPV, cervical cancer, and Gardasil. The HBM was used to construct survey questions and to analyze the data of the survey responses.

**Purpose of the Study**

The purpose of this study is to examine the prevalence of college females who have gotten the Gardasil vaccine and what their motivation was in the context of the Health Belief Model (HBM). When the motivation is determined using the HBM practitioners can use these findings to motivate women to get the vaccine in the most effective way possible. This study attempts to fill the gaps between mandating the vaccine and what motivates women to get the vaccine. Additionally, this study looks at who women are talking about HPV and Gardasil with and in what context. We also look at the knowledge base of what women know about HPV, cervical cancer, and Gardasil.
Methods

Participants and Procedures

For this research participants were female students from Miami University’s Communication (COM) 135 classes. Eighty-one students participated in this survey. This project was approved by the Institutional Review Board (IRB). After it was approved, we then sent an email to the Communication 135 classes with the link to the survey. Females volunteered for the survey but were rewarded extra credit in their COM 135 class for their participation. The closed ended questions were analyzed using the research tool SPSS to come up with our test statistics. The research participants mean age was 19.65 years ($SD = 1.14$, minimum = 17.0, maximum = 23.0). The mean year in college was sophomore ($M = 2.26$, $SD = 1.05$, minimum = freshman, maximum = super-senior). The Health Belief Model was used along with questions gathered from previous research for the survey to help us understand females in regard to the Gardasil vaccine and the Human Papillomavirus. More specifically, based on previous research I generated questions that would get at the attitudes, beliefs, and experiences of female students on Miami University’s campus toward the Gardasil vaccine and HPV. The survey was administered via checkboxonline.com and was anonymous. Correlations were conducted to test each hypothesis.

Measures

Perceived Benefits. Perceived benefits was measured via three likert type questions from strongly disagree (1) to strongly agree (5). For example, “Getting vaccinated against the HPV infection would be a good way to protect my health.” The mean was 4.06 ($SD = .82$, minimum=1, maximum=5, Cronbach’s alpha = .80).

Perceived Barriers. Perceived barriers to getting the vaccine was measured with six questions (e.g. “I do not want to be vaccinated,” and “The HPV/Gardasil vaccination has unpleasant side-effects”) on a likert type scale from strongly disagree (1) to strongly agree (5). The mean was 3.75 ($SD = .68$, minimum = 1, maximum = 4, Cronbach’s alpha = .75).

Perceived Susceptibility. Perceived susceptibility was measured with six likert type questions from strongly disagree (1) to strongly agree (5). Example items include, “I have
an increased risk of falling ill with HPV” and “I have an increased risk of falling ill with Cervical Cancer.” The mean was 2.81 ($SD = .56$, minimum=2, maximum=5, Cronbach’s alpha = .57).

**Perceived Severity.** Six likert type questions from strongly disagree (1) to strongly agree (5) were used to measure perceived severity. Example items include: “The HPV infection may lead to serious health problems” and “I am afraid HPV would make me very sick.” The mean was 3.92 ($SD = .77$; minimum = 1, maximum = 5, Cronbach’s alpha = .75). For greater reliability the scale was changed from 6 items ($\alpha = .61$) to 3 items ($\alpha = .75$). The original six items that were used in the scale were: (1) “The HPV infection may lead to serious health problems,” (2) “I am afraid HPV would make me very sick,” and (3) “I am afraid cervical cancer would make me very sick,” (4) “I am very worried about catching HPV,” (5) “How serious would it be for you to get infected with HPV knowing that there is no cure for it?,” and (6) “How serious would being infected with HPV be to your peace of mind?” The three items that were deleted were: (1) “I am very worried about catching HPV,” (2) “How serious would it be for you to get infected with HPV knowing that there is no cure for it?” and “(3) How serious would being infected with HPV be to your peace of mind?” The questions that were kept might have been more reliable because they all concerned health problems. The other questions dealt with catching the virus and knowing that there is no cure for HPV, and with a person’s peace of mind which are not as internal as having health related problems or being sick.

**Perceived Self-efficacy.** Three likert type questions anchored from strongly disagree (1) to strongly agree (5) were used to measure perceived self-efficacy (e.g. “How sure are you that you could get three shots of the HPV vaccination if you have a fear of needles or shots.”). The mean was 3.61 ($SD = .73$, minimum = 1, maximum = 4, Cronbach’s alpha = .60). For greater reliability, one item was removed (e.g., “How sure are you that you could get three shots of the HPV vaccination if you didn’t have the money to pay for it?”). The two-item scale was comprised of the following items: (a) “How sure are you that you could get three shots of the HPV vaccination if you have a fear of needles or shots?” and (b) “How sure are you that you could get three shots of the HPV vaccination if you are embarrassed to talk about sex with a doctor or healthcare
These questions had to deal with internal attributes rather than the third that made it less reliable which had to do with an external factor. Cronbach’s alpha moved from .51, with three items to .60, with two items.

*Cues to Action. Cues to Action* was measured with three likert type questions from strongly disagree (1) to strongly agree (5). An example items is: “There are so many recommendations about vaccines out there I don’t know what is good or bad.” The mean was 3.89 (SD = .73, minimum = 1, maximum = 4, $\alpha = .89$). For greater reliability our scale changed from three questions to two questions. The reliability changed substantially, from .39 to .89, when one item was deleted. The item that was deleted to achieve the higher reliability was “There are so many recommendations about vaccines out there; I don’t know what is good or bad.” The two that were more reliable were (1) “If there were reliable information and easy steps to follow, people would change their rate of vaccination to lower their chances of getting HPV” and (2) “If there were reliable information and easy steps to follow, people would change their rate of vaccinations to lower their chances of getting cervical cancer.”

Another aspect of the Gardasil vaccine that was of interest was to find out who women are talking to about Gardasil, HPV, and cervical cancer. To investigate this issue, participants were asked 34 yes or no questions (e.g. “Do you have a sense of how many of your female friends have been vaccinated”). The other questions were set up to find out with whom females are talking about Gardasil, HPV, or cervical cancer. (e.g. “Relatedly, have you talked to your (e.g., mother; sister; cousin; etc.) ____ about Gardasil?”) These questions were set up in a way that allowed respondents to check all of the people that they had talked to for each Gardasil, HPV, or cervical cancer.

The final question I wanted to explore had to do with doctor patient communication. I wanted to know if females who had talked to a healthcare provider about HPV, would they be more likely to be vaccinated. To examine this question, participants were asked “Have you ever talked to a healthcare provider about HPV?” where they could answer either “Yes” or “No”.

In addition to the closed ended response questions, participants were asked a series of open ended questions to further examine perceptions of and experiences with HPV and Gardasil. For example, participants were asked “Has a healthcare provider ever
told you that you have HPV?” This question explored whether participants heard of and/or discussed HPV with a healthcare provider. Another example of an open ended question was “How did you hear about the vaccine.” This question was asked to find out if respondents were aware of the vaccine from many different sources or if they had only heard it from certain places such as their doctor. These questions were analyzed by counting the responses to see if there were common themes. I found the total of answers to each question and then looked to see if there were many answers that were written in by multiple respondents.

**Results**

The first hypothesis predicted that if women perceive lots of benefits of the HPV vaccine, then they will be more likely to get vaccinated. To test this, perceived benefits was correlated with the question “have you been vaccinated against HPV” \((r = -.39; p < .001)\). Hence, hypothesis one was partially supported. The results were significant, but not in the direction I predicted.

The second hypothesis predicted that the lower women's perceived barriers toward getting vaccinated against HPV with Gardasil, the more likely they will be to get vaccinated. Perceived barriers was correlated with the question “have you been vaccinated against HPV” to get a Point biserial Correlation of -.61 which was found to be significant with a \(p < .001\) level; hypothesis two was supported.

The third hypothesis predicted that the more women felt susceptible to HPV and/or cervical, the more likely they would be to get vaccinated. To test this hypothesis, perceived susceptibility was correlated with the question “have you been vaccinated against HPV” \((\text{Point biserial Correlation} = .10, p > .05)\). The third hypothesis was not supported.

The fourth hypothesis predicted that as women’s perceived severity increased, they would be more likely to get vaccinated. To examine this hypothesis, perceived severity was correlated with the question “have you been vaccinated against HPV.” The Point biserial Correlation was -.15 \((p > .05)\); hence, the fourth hypothesis was not supported.

The fifth hypothesis posited that as women’s perceived self-efficacy increased, they would be more likely to get vaccinated. Perceived self-efficacy was correlated with
the question “have you been vaccinated against HPV” to yield a Point biserial Correlation of -.25, which was found to be not significant (\( p > .05 \)); the fifth hypothesis was not supported.

The sixth hypothesis stated was the more cues to action in women’s life the more likely they will be to get vaccinated. Cues to Action was correlated with “have you been vaccinated against HPV” and produced a Point biserial Correlation of -.03 which was found to be not significant (\( p > .05 \)). As a result, the sixth hypothesis was not supported.

The seventh hypothesis examined the relationship between the number of people with whom women talk to about cervical cancer and their likelihood to get vaccinated. This was measured by asking the question “Have you ever talked to someone other than a healthcare provider about HPV? The results from this question were 61 respondents had talked to someone other than a healthcare provider about HPV and 18 had not. The other question asked was “Do you have a sense of how many of your female friends have been vaccinated?” Forty-two responded yes and 36 responded no.

The last hypothesis posited that if women talk to their healthcare providers about HPV, they would be more likely to get vaccinated. To test this hypothesis, the question “Have you ever talked to a healthcare provider about HPV” and the question “Have you been vaccinated against HPV” were correlated. Results revealed 41 respondents talked to a healthcare provider about HPV and got the vaccine. Sixteen respondents talked to a healthcare provider about HPV and did not get vaccinated.

Along with the hypothesis that dealt with motivating factors that women would get vaccinated with the Gardasil vaccine, open ended questions were analyzed to find out other important information about college females. The open-ended questions ranged from their knowledge of HPV to if they had talked to someone other than a healthcare provider. The results that were produced showed that eighty of the eighty-one respondents had heard of the Human Papillomavirus. Seventy-seven respondents stated that they had heard of the Gardasil vaccine and three said they had not heard of it. Seventy-Two respondents had heard of a vaccine to protect against cervical cancer and 8 respondents had not heard of that type of vaccine. When asked “Have you ever talked to a healthcare provider about HPV?”—58 answered yes they have and 22 had not. Eleven respondents had been told by a healthcare provider that they had HPV. Sixty-One
respondents had talked to someone other than a healthcare provider. Fifty-one respondents had been vaccinated against HPV and 29 said that they had not been vaccinated.

Participants were also asked closed and open ended questions about if they had heard about the vaccine, when or if they got the vaccine and with whom they are talking about the vaccine (e.g. “Have you ever heard anything about a vaccine that prevents cervical cancer?” and “Relatedly have you talked with your (fill in the blank) about Gardasil?”).

For the open ended questions respondents reported similar answers to the results of the closed ended questions. Of the females who had the Gardasil vaccination, all of them received the vaccine at their doctors’ office, most of them in their home town; however, some had the vaccine while they were in school in Oxford, Ohio. The data was compiled to find out where each respondent indicated they had received the vaccinations. I ran frequencies which showed the prevalence of each response. After all of the responses were compiled I found themes that were generated from the data. All but two of the respondents who had the vaccine have had all three doses. All of the respondents who had the vaccine stated that insurance and/or their parents paid for the vaccine. Some of the top reasons females choose to get vaccinate were (1) for protection or prevention (2) their doctor suggested that the vaccination take place to prevent HPV (3) that their parents suggested or made them get vaccinated. Other responses as to why they chose to
get vaccinated were that they would rather be safe than sorry, because they saw the advertisements about getting vaccinated, and to stay healthy. Respondent 1 said “My main reason was, why not? A woman needs to protect her body, and that was just one way of doing it.” Respondent 2 said “My doctor recommended it; I recognized the vaccinations from the commercials and thought it would be a good thing to do, and my mom supported me getting it. Respondent 3 said “I don't see why someone wouldn't get the shot. It was easy, and I don't ever want HPV.” Respondent 4 opposed to the vaccination said “I am not sexually active and will not be until I am married. I see no need to get the vaccination.”

The average number of friends that women reported knowing who have received the vaccine was 13.93 friends (minimum=1, maximum=50); 11 respondents stated that most or all of their friends have been vaccinated.

When asked if women talk with other people about HPV, participants stated they talk with their mothers (N=46 respondents), best female friend (N=36), siblings (N=15), and boyfriend (N=13). They also noted they talk to their best male friend, cousins, doctors, teacher(s), and to other friends. In regard to cervical cancer, and who women are talking to, they talk with their mothers (N=45), best female friend (N=22), their siblings (N=12), and boyfriend (N=8). They also talked to their best male friend, cousins, doctors, aunt(s), and their other friends. When asked with whom they have talked with about Gardasil, 64 respondents said with their mothers, while they also talked with their best female friend (N=50), siblings (N=23), and with their boyfriend (N=10). They also talked with their girlfriend, best male friend, cousins, doctor and other friends.
When asked where and how they had heard about Gardasil, they heard about it from TV commercials (N=62), from friends (N=58), from parents (N=57), from magazine ads (N=43), and from other relatives (N=13). They also responded that they had heard about Gardasil from their doctor, from school, from flyers on campus, from boyfriend/girlfriend, and from this survey (N=2).

When asked when they were vaccinated, 8 said in 2009, 21 said in 2008, 9 in 2007, 2 in 2006, and 5 respondents put down that it was received in high school with no date indicated. Eighty respondents had heard of the Human Papillomavirus, 77 had heard of Gardasil, and 72 had heard of a vaccine to prevent cervical cancer. Eighteen respondents’ vaccines were paid for by their parents, 18 by their insurance company and 13 were paid for by a combination of their parents and insurance companies.

Respondents were asked was “What were the top 3 reasons for getting vaccinated?” The results revealed that participants were vaccinated: (a) to prevent a needless disease/protection (N=30), (b) because their doctor recommended it (N=24), (c) because their parents/family motivated them to get the vaccine (N=16), (d) because it was convenient and safe (N=7), and (e) because it was a good idea (N=4). Other reasons were because they had known someone who had gotten HPV, because their insurance paid for it, because they heard about it through advertisements, because they had talked to friends who were getting it, because they were afraid they would get HPV, because they did not want to lose the ability to have children, because they wanted to stay healthy, because they wanted to get it while they were in college, and because they were sexually active or will be.

**Discussion**

This study attempted to look at the relationship between the HBM and the factors involved in females’ decision to protect themselves against HPV and cervical cancer with the Gardasil vaccine. The factors included were perceived benefits, perceived barriers, perceived susceptibility, perceived seriousness, perceived self-efficacy, and cues to action. In addition, the prevalence of the knowledge of HPV, Gardasil, a vaccine to prevent cancer, and finding out who women are talking about HPV with were explored.
Along with finding out if women have been told if they had HPV, eleven people in the study had been told by a healthcare provider that they had HPV.

Perceived benefits and perceived barriers seemed to be correlated with female college students’ motivation to get the Gardasil vaccine, with perceived barriers being strongly correlated. From this research perceived susceptibility, perceived severity, perceived self-efficacy, and cues to action were not correlated with motivation in a young female college student’s life in regard to getting vaccinated against HPV. In regard to perceived benefits however, the data showed that when perceived benefits increased the likelihood to get vaccinated decreased and when perceived benefits decreased the likelihood to get vaccinated increased. One possible reason for this finding could be that the ‘benefits’ that were measured were not perceived as beneficial to this sample of women. More specifically, one benefit to college-aged women might be that the vaccine would allow them to have sex with people and not worry about passing HPV to their partner so that they will not get a reputation of spreading HPV. Or there could be other benefits that are more important to women that were not captured in the questions used. In the future it would be useful to have an open ended question to ask respondents “what are some benefits to getting the Gardasil vaccine?”

In regard to perceived barriers the data showed that when perceived barriers decrease, then respondents were more likely to be vaccinated. This data makes sense because if there are few things preventing women from getting the vaccine it would be easier to get vaccinated.

It was somewhat surprising that there was no relationship between perceived susceptibility and likelihood to get vaccinated. One explanation could be because college students feel invincible and therefore, do not see a need for the Gardasil vaccine. They think that the rules of the real world do not apply to them because they are in college and/or a common myth is that “STIs only happen to other people.” These respondents may feel like they are in a safe environment and that if they get in trouble their parents will help them get out of trouble. Students at Miami may not necessarily be aware of the consequences of their actions because they still have their parents to go to if they need help. They may also have optimistic bias which is the feeling that bad things only happen to other people, not to themselves. Much literature on optimistic bias has to do with
health issues such as feeling as if people can control their diabetes better, or that they do not have to wear sunscreen because they will not get skin cancer (Chapin & Coleman, 2009). Along with these health issues most people probably think they will not get HPV. Many students at Miami probably feel this way also and may not feel that they can get HPV or cervical cancer. Students may not be aware that if they are engaging in behavior that could transmit HPV that they could get cervical cancer in the future.

There could also be multiple reasons as to why perceived severity was not correlated with the likelihood to get vaccinated with Gardasil. One reason might be because the effects of HPV and cervical cancer are not immediate. If someone contracted genital warts they may not show up for many months, which may not seem so severe. They also, given there are numerous strains of HPV, some of which are self-correcting; there may be confusion about appropriate symptoms, treatment, transmission, etc. Relatedly, young women may think that if they do get HPV they can just go to the doctor and get medicine. In the case of cervical cancer the signs or symptoms of the disease may not show up for many years. Hence the consequences of HPV and/or the severity of the virus may seem less salient given the time-lag between when one contracts the virus and the disease state (i.e., cervical cancer). A more severe result for college students now may be if they get pregnant from unprotected sex rather if they get an infection which may seem easier to deal with.

Females may not feel as if the question “I get sick more easily than other people my age” makes them more susceptible to getting HPV. They may feel that having more sex partners makes them more susceptible to getting HPV, or not using condoms regularly could make them more susceptible to HPV. For perceived severity the questions such as “I am afraid HPV would make me very sick” may not be as serious to college females as something such as not being able to hang out with friends or find a boyfriend because she has HPV. There needs to be more research to figure out what susceptibility and seriousness means to college females.

Perceived susceptibility, perceived severity, perceived self-efficacy, and cues to action were not found to be correlated with getting vaccinated. The lack of findings may be because the effects of HPV are not affecting college students in the present. These constructs have to do with long term effects which college students may not think they
need to worry about until they reach that point in time. The research that has used the HBM in the past looked at people who are older which may make these scales more reliable for older people as opposed to younger people because they have different priorities and are motivated by different factors. The questions for perceived susceptibility, perceived severity, perceived self-efficacy, and cues to action may have had lower reliabilities and correlation results if respondents did not see how these questions relate to them. An example may be the question “I have an increased risk of falling ill with cervical cancer.” This question may not feel applicable to females who are in the late teens to early 20s because they may think that they are healthy and will stay healthy.

For perceived self-efficacy questions such as “How sure are you that you could get three shots of the HPV vaccination if you are embarrassed to talk to a doctor or healthcare provider?” may not be a problem for women in this sample. They may think that not having enough time because of school, work, and their social life causes them to not feel as if they can get vaccinated. Cues to action being measured with regard to other people’s vaccination rate in relationship to more reliable information may have made the question seem like it was talking about other people and not the person taking the survey.

The questions in regard to Hypothesis Seven asked if a female had talked to someone other than a healthcare provider. I also asked if they had a sense of how many of their female friends had been vaccinated. These questions did not have a relationship with whether or not they had been vaccinated. The results of the survey found that there were students who were not talking to other people about Gardasil or HPV and who had the vaccine. It was also found that there were students who were talking to other people about HPV and Gardasil and were not vaccinated against HPV.

The data seemed to show a relationship between talking to a healthcare provider and an increased vaccination rate of Gardasil. This could be because doctors are experts on health topics and when these respondents go to a doctor they are more likely to listen to their response because they are knowledgeable on the HPV.

Also, the issue if women had talked to someone other than a healthcare provider about HPV was not found to be related to whether or not they had received the vaccine. It may be that we did not ask how someone was talking with others about HPV that caused
the correlation to be lower. Females may talk to the people reported about HPV, but maybe they are talking about the negatives of it, or maybe they are only talking about it in passing and not directly talking about how it affects them. However, with the information that we gathered, it was also observed that most college students are aware of the vaccine from multiple sources.

I was surprised that perceived seriousness and cues to action were not correlated with motivation to get vaccinated because it seems like people would be afraid of dying from a disease if they caught it. It would seem that most people would want to avoid getting cancer because it seems like an extremely serious disease and most people know at least one person who has had some type of cancer. I would have thought that being able to prevent cancer would be extremely motivating because most people know how deadly it can be. However, young people tend to feel invincible and may not think about the future and what may result from their experiences now. They may think that it is not going to happen to them because they are special or they don’t have to worry about it because it only happens to other people. This is not true and the statistics of how many college students get an STI need to be more prevalent so students know that it can happen to them. Also, cues to action would seem to be more highly correlated because, if there is lots of information showing all of the positives of the vaccines people would seem more willing to get vaccinated. The target age group for the vaccine is college aged people so it would seem that there would be more cues to action focused on them.

Perceived barriers was correlated with college females’ motivation because it is something tangible that they can see now rather than waiting for in the future. They can see that if they do not have to worry about side effects from the vaccine then they may be more willing to get the vaccine. Students in the college setting as stated early are more likely to be sexually active and have more partners which puts them at greater risks. If they can see that there are low barriers to getting the vaccination then they are more likely to protect themselves.

Other patterns that were found in this research were that many of the respondents who had been vaccinated had been vaccinated before they came to college or soon after starting college. This could be because they are preparing for being in a different
environment and wanted to take any precautions to protect themselves. This would give them less to worry about during a huge transition in their young life.

The results for some parts of the research were what I expected to find and for others I was surprised at what I found. I was surprised that a few people had never heard of the vaccine and that someone had never heard of HPV. With all of the information available in all different venues I thought that everyone would have at least heard of the virus even if they did not know much about it. I was surprised that many of the respondents, if vaccinated, had been vaccinated for a year or more. The vaccine is still new and I thought that many college females would only had gotten the vaccine just recently because it is not required for entrance into school, but surprisingly females are protecting themselves by getting vaccinated before they get to college. Over half of the respondents had been vaccinated, so hopefully this is true of the greater population of college students to cut back on the spread of HPV.

The sample size of this research is not as large as I had hoped to achieve. However, it seems that the information gathered is what I had heard in anecdotal ways around campus and may be generalizable in a way but more students would need to be researched and surveyed to see if this information can relate to a population at large.

Some of the limitations of my research are that it is not a causal model, it only looks at relationships and does not predict behavior. If I were to do this research all over again I would want to find a way to find causal relationships between women’s behavior toward getting vaccinated against HPV. To conceptualize this research researchers could ask respondents “How do different types of information sources contribute to female’s motivation to get vaccinated against HPV with Gardasil.” Or “How do different types of benefits or barriers motivate females to get vaccinated.”

Another limitation of this research was that it only looked at Gardasil as the only vaccine that prevents against HPV. It did not take into account the vaccine Cervarix which also protects against HPV. If females had been vaccinated with Cervarix then they were not taken into account in the questions and the results may have been different if this had been included.

Throughout this research much information has been uncovered about all the issues surrounding this vaccine and HPV. It is a controversial topic, but all people should
be aware of the consequences of their sexual activity level now or their level in the future; and they should think about making an informed decision to protect themselves against a disease that can be prevented. People should be aware that even if they are not sexually active now they may be sexually active with someone who has had multiple partners and could possibly pass HPV on to them. There is no guarantee that your sexual partner knows what disease their other partners had and no way to know if they could pass it on to you.

It would be interesting to find out now that females were exposed to information on Gardasil, HPV, and cervical cancer via the survey, would they be more willing to get vaccinated because they are more aware of the options out there and the dangers of getting HPV. If research were done in the future on this topic it would be interesting if a pre-test post-test was completed to see if females who had not had the vaccine before being exposed to information about Gardasil, HPV, and cervical cancer would decide to get vaccinated because of the exposure. This could find out if exposure to information on Gardasil to protect against HPV and cervical cancer is a motivating factor to get vaccinated.

**Recommendations and Conclusions**

More research is needed to see if these results are concurrent with other college aged females, not just those at Miami University. If another study were done with college students it would be better to have more participants to get a more general understanding of the University atmosphere rather than just students from a particular set of classes. If this were to happen there may be more varied results that may generalize better to university settings across the country. In particular to this sample it was all females and all the general population of Miami students is upper class families who are well educated and who all are required to have insurance to attend Miami. This sample might be unique because if it was done at a community college or another college who has less homogeneous student population and who were not required to have insurance, fewer students may have reported to have been vaccinated. It would also be of interest to look at both males and females to see if the rates are the same or different for vaccination or if there are different motivating factors for females than there are for males.
Appendix 1

1. Hypothesis one is the more benefits a woman sees from getting the vaccine the more likely she will be to get it.
   a. Perceived Benefits
      i. Getting vaccinated against the HPV infection would be a good way to protect my health. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      ii. Getting vaccinated against the HPV infection would decrease my fear of getting infected with HPV. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      iii. Getting vaccinated against HPV would be a responsible thing to do. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
   b. Likelihood of getting Gardasil vaccine
      i. Have you been vaccinated against HPV?

2. The second hypothesis is the fewer barriers women have toward getting the Gardasil vaccine the more likely she will be to get the vaccine.
   a. Perceived Barriers
      i. I do not want to be vaccinated. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      ii. The HPV/Gardasil vaccination has unpleasant side-effects. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      iii. In general I am opposed to vaccinations. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      iv. It is too much trouble for me to go to the doctor’s to be vaccinated. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      v. The HPV vaccination weakens the natural immune system. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      vi. The HPV vaccinations are too expensive. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
   b. Likelihood of getting Gardasil vaccine
      i. Have you been vaccinated against HPV?

3. The third hypothesis is the more susceptible a woman feels of getting HPV the more likely she will be to get the Gardasil vaccine.
   a. Perceived Susceptibility
      i. I have an increased risk of falling ill with HPV. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      ii. I have an increased risk of falling ill with Cervical Cancer. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
iii. I am concerned about the risk of falling seriously ill. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)

iv. I get sick more easily than other people my age. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)

v. I am less likely than most people to get infected with HPV. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)

vi. My body could fight off the HPV infection. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)

b. Likelihood of getting Gardasil vaccine
   i. Have you been vaccinated against HPV?

4. The forth hypothesis is the more serious she perceives the disease to be the more likely she will be to get the vaccine.
   a. Perceived Seriousness
      i. The HPV infection may lead to serious health problems. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      ii. I am afraid HPV would make me very sick. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      iii. I am afraid Cervical Cancer would make me very sick. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      iv. I am very worried about catching HPV. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      v. How serious would it be for you to get infected with HPV knowing that there is no cure for it? (Not at all serious=1 to Extremely Serious=5)
      vi. How serious would being infected with HPV be to your peace of mind? (Not at all Serious=1 to Extremely Serious=5)
   b. Likelihood of getting Gardasil vaccine
      i. Have you been vaccinated against HPV?

5. The fifth hypothesis is the more cues to action in a woman’s life the more likely she will be to get the vaccine.
   a. Cues to Action
      i. There are so many recommendations about vaccines out there; I don’t know what is good or bad. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)
      ii. If there were reliable information and easy steps to follow, people would change their rate of vaccinations to lower their chances of
getting HPV. Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly agree (5)

iii. If there were reliable information and easy steps to follow, people
would change their rate of vaccinations to lower their chances of
getting cervical cancer. Strongly disagree (1), Disagree (2),
Neutral (3), Agree (4), Strongly agree (5)

b. Likelihood of getting Gardasil vaccine
   i. Have you been vaccinated against HPV?

6. The sixth hypothesis is the more able she feels she can get the vaccine, the more
likely she will be to get the vaccine.
   a. Self-Efficacy
      i. How sure are you that you could get three shots of the HPV
         vaccination if you have a fear of needles or shots? (Not sure at
         All=1 to Very Sure=5)
      ii. How sure are you that you could get three shots of the HPV
          vaccination if you are embarrassed to talk about sex with a doctor
          or healthcare provider? (Not sure at All=1 to Very Sure=5)
      iii. How sure are you that you could get the three shots of the HPV
           vaccination if you didn’t have the money to pay for it? (Not sure at
           All=1 to Very Sure=5)
   b. Likelihood of getting Gardasil vaccine
      i. Have you been vaccinated against HPV?

7. The seventh hypothesis is the more people with whom a woman talks to about
HPV and Gardasil; the more likely she will be to get the vaccine.
   a. Number of people female talks to about HPV and Gardasil
      i. Have you ever talked to someone other than a healthcare provider
         about HPV? Yes or No
      ii. Do you have a sense of how many of your female friends have been
          vaccinated? Yes or No
   b. Likelihood of getting Gardasil vaccine
      i. Have you been vaccinated against HPV?

8. The eighth hypothesis is if women talk to their doctor about the vaccine they are
more likely to get vaccinated against HPV.
   a. Have you ever talked to a healthcare provider about HPV? Yes or No
   b. Likelihood of getting Gardasil vaccine
      i. Have you been vaccinated against HPV?

9. Has a healthcare provider ever told you that you have HPV?
10. If so please provide a rough estimate of how many of your friends have been vaccinated.
11. If vaccinated, when were you vaccinated?
12. Who paid for the vaccination?
13. What were the top 3 reasons for getting vaccinated or planning to get vaccinated?
   And/or what motivated you to get the vaccine?
14. Have you ever heard of the Human Papillomavirus (HPV)?
15. Have you heard of Gardasil (i.e. the HPV vaccine)?
16. Have you ever heard anything about a vaccine that prevents cervical cancer?
17. Where and how have you heard about Gardasil?
18. Relatedly, have you talked with your__________about Gardasil?
19. Relatedly, have you talked with your__________about HPV?
20. Relatedly, have you talked with your__________about Cervical Cancer?

The questions used are in italics.
The questions bolded were reversed coded.

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