
HPV Knowledge Among Female College Students and the Short Term Effectiveness of HPV Education

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Citation

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Abstract

Human Papillomavirus (HPV) is the most common sexually transmitted infection affecting one-half to three-fourths of sexually active individuals over the course of their lifetime. It causes genital warts, cervical dysplasia, and cervical cancer. Although HPV has been in the news recently with the FDA's approval of the Gardasil vaccine, many women are still unclear on the basic facts regarding HPV and cervical cancer. The purpose of this study was to determine if a brief educational intervention improves college enrolled women's knowledge on HPV. To test this, a study was designed which tested a small group of college-enrolled females on basic HPV information using a questionnaire which contained seven true or false questions about HPV and related issues. The students were then briefly educated on HPV, provided with an informative handout, and tested again one month after this intervention. Students scored significantly better on HPV questions one month post-intervention, demonstrating increased knowledge of basic HPV information. This study suggested that brief HPV education, which can easily be replicated in a clinician's office, does increase short term knowledge on HPV. Although further studies are necessary regarding the effects of HPV education, education in the classroom or clinician's office should be considered as a preventative measure for genital warts and cervical cancer.

BACKGROUND

The human papillomavirus, otherwise known as HPV, is a sexually transmitted infection that causes genital warts and is linked to most cases of cervical cancer. HPV is the most commonly sexually acquired infection in the United States, infecting at least 50-75% of sexually active men and women at some point in their lives (1). Approximately 20 million Americans currently carry this virus, with another 6.2 million new infections per year (1). It is estimated that in 2008, 11,070 women in the United States were diagnosed with invasive cervical cancer and 3,870 died (2).

HPV is spread through sexual activity with an infected individual. Although condoms do provide some protection, the virus is transmitted by skin to skin contact making it possible to come into contact with the virus even when a condom is used.

Abstinence, limiting the number of sexual partners, and having monogamous relationships can all reduce the chance of contracting HPV.

Papilloma viruses only can live in squamous epithelial cells which are found on the surface of the skin, cervix, vagina,

anus, vulva, head of the penis and the mucous membranes of the mouth and throat. There are over 100 strains of HPV, 40 of which can affect the mucous membranes of the genitals. The other 60 strains of HPV can cause warts on non-genital skin such as the hands.

There are two classifications of anogenital strains of HPV – low risk and high risk. HPV-6 and HPV-11 are considered low risk stains and can present as genital warts, otherwise known as condyloma acuminatum. These are most often cauliflower-shaped warts which normally appear weeks to several months after contact with an infected partner. They can present on the labia, vagina, cervix, penis, or anus. Rarely, genital warts can appear several years after initial contact with the virus. These lesions do not progress to cancer. HPV-6 and HPV-11 can sometimes cause a low-grade change to the cervix but this will most often resolve on its own or will develop into a wart.

High risk strains are HPV-16, 18, 31, 35, 39, 45, 51, 52, and 58. These are the strains that put a woman at risk for cervical cancer. More than 99% of cervical cancers are related to HPV and 70% of these are related to HPV-16 and HPV-18 (1). Changes to the cells of the cervix can be detected with a

pap smear. These changes can be low- grade (low grade squamous intraepithelial lesions [LSIL], or cervical intraepithelial neoplasia I [CIN I]), high grade/precancerous (high-grade squamous intraepithelial lesions [HSIL], CIN II, or CIN III), or cancerous. High risk strains can sometimes cause low grade changes so a clinician may choose to further investigate or monitor these changes through more frequent pap smears. When a pap smear report returns with high grade changes, most often HPV DNA testing is done to determine if HPV is present in the cells of the cervix. In many women who have low or high grade changes, these changes resolve on their own and women have a normal pap smear at a later time; however, if the body is unable to rid itself of the virus, these changes can progress to precancerous changes or cancer of the cervix in some women. Further evaluation can be done using colposcopy or cone biopsy. Rarely HPV causes cancerous lesions on the anus, penis, vulva, or labia.

Most individuals who acquire this virus do not show symptoms. Roughly 70% of those individuals infected clear the virus from their bodies within one year, and 90% of will clear the infection within two years (1).

There is no cure for HPV, but genital warts can be treated through cryotherapy, surgical removal, laser surgery, or topical preparations such as podofilox. If not treated, genital warts may resolve on their own, stay the same, or grow in size and number.

If cervical cancer is not detected early through a pap smear, it most commonly presents as abnormal vaginal bleeding such as blood tinged leucorrhea, spotting, frank bleeding, or post-coital bleeding. Abnormal discharge is also common and may be purulent, odorous, and non-pruritic. Pelvic pain, urinary or fecal incontinence, weakness, weight loss, and anemia may be found with late stages of the disease. On physical exam, preclinical disease may present with a normal-appearing cervix. However, as the cancer progresses, the cervix may become enlarged, irregular, and firm. The cervix may develop a barrel shaped appearance (endophytic) or the lesion may be friable and cauliflower-like (exophytic). Ulcerations may be present. Vaginal fornices may then become involved and extensive involvement is often characterized by nodular thickening of the uterosacral and cardinal ligaments, resulting in loss of mobility of the cervix.

Cervical cancer is staged according to the International Federation of Gynecology and Obstetrics (FIGO) classifications (3). Stage 0 is Carcinoma in situ. Stage I is

cervical carcinoma confined to the cervix. Stage II is cervical carcinoma which extends beyond the uterus, but not to the sidewalls of the pelvis or the lower third of the vagina. Stage III includes tumors that extend to the sidewall and/or cause hydronephrosis and/or extend to the lower third of the vagina. Stage IV cervical cancer includes tumors which extend beyond the true pelvis and into the mucous of the rectum or bladder. This stage also can include distant metastases. Stages can be further specified under subcategories for each stage.

In general, treatment of cervical cancer is based on staging, age of patient, desire to preserve fertility, and even desire for future sexual activity. It generally includes radical hysterectomy and pelvic lymphadenectomy, radiation and chemotherapy, or a combination of these treatments. In some cases of women who wish to preserve fertility, radical trachelectomy, lymphadenectomy, and radical resection of the cervix followed by cerclage can sometimes be used.

In 2006, the FDA approved Gardasil, a recombinant vaccine that protects against HPV 6, 11, 16, and 18. HPV-6 and HPV-11 cause 90% of genital warts and HPV-16 and HPV-18 cause 70% of cervical cancers (4). Gardasil contains L1 VLPs of HPV-6, 11, 16, and 18, which are composed of the recombinant L1 major capsid protein for the HPV type. These particles contain no viral DNA so they are unable to infect cells or reproduce. The body has an immune response to the vaccine resulting in anti-papillomavirus antibodies which protect against infection in the case of future contact with the virus. The vaccine is given in a series of three intramuscular injections at 1 month, 2 months, and 6 months and is approved for females age 9-26. It is only effective against a strain of HPV if an individual has not already been exposed to that particular strain. It is contraindicated in women who have had a severe allergic reaction to yeast or a previous dose, and not recommended in pregnant women. Side effects include headache, fever, nausea, dizziness, pain at injection-site, swelling, erythema, pruritus, and bruising. Rarely Guillain-Barre Syndrome has been reported (5). Research is currently underway for FDA approval of another vaccine called Cervarix which only protects against high risk strains HPV-16 and HPV-18 (6).

Considering the prevalence of HPV and the health issues it causes, preventative measures are important. If a brief HPV educational intervention increases short term knowledge on HPV and can easily be replicated in a clinician's office, then it should be considered as an inexpensive preventative

measure for genital warts and cervical cancer.

METHODS

The design of this study was loosely based on a study done by Erika Lambert, MD in 2001 entitled “College Students’ Knowledge of Human Papillomavirus and Effectiveness of a Brief Educational Intervention” (7).

Students from a private college in Northeastern Pennsylvania were selected to participate in this study. Permission to survey the student population was granted by King’s College’s Institutional Review Board. Three classes of students were surveyed. These classes included students in the Pre-Physician Assistant Program major, Athletic Training major, and Neuroscience major. None of the students received formal HPV education in the classes they had taken.

Participants received a cover letter explaining the purpose of the study, confidentiality, and were asked to voluntarily participate. An informed consent was signed by all participants. The students were asked to anonymously fill out a questionnaire which included 7 true-false questions about HPV and related health issues. The questionnaire included demographic questions about age and gender. The students were also asked to indicate whether or not they had ever received information (written or oral) from their doctor or healthcare provider regarding HPV or the HPV vaccine. All students in the three classes were asked to fill out questionnaires, but were made aware, both orally and on the cover letter, that only the information from females between the ages 18-23 would be used.

Students were asked to fill out the questionnaires inside the classroom. After returning the questionnaires, the students were spoken to briefly about HPV and health related issues. They were also given a two-sided educational handout about HPV. Students overlapped between classes but were asked to fill out the questionnaire only once.

One month after the initial questionnaire and educational intervention, students were asked to fill out the same questionnaire. They were also asked to indicate whether or not they had received any additional information on HPV from a healthcare provider since filling out the original questionnaire. Results of the pre-intervention and post-intervention questionnaires were then compared to determine the effectiveness of the oral and written information presented to them in increasing their knowledge about HPV.

VARIABLES

In addition to the 7 true-false questions, patients were asked to indicate age, gender, and whether or not they had ever received information about HPV or the HPV vaccine from their doctor or healthcare provider. Only questionnaires from females, ages 18-23 were included in the analysis. The study explored the relationship between the questionnaire score and whether or not the participant reported being educated about this topic from a doctor or healthcare provider. Educational background was not taken into consideration other than the students had not taken any college classes which discussed HPV in detail.

Although these basic variables were taken into consideration when designing the study, the main objective was to compare the baseline knowledge of the sample population with their knowledge one month after being formally educated on this topic in order to evaluate the effectiveness of a simple educational intervention about an important health topic.

ANALYSIS

Data was analyzed using a General Linear Model procedure. All analyses were performed using SPSS.

RESULTS

Sixty-three students were initially surveyed in the classroom. Thirty-two of these participants were females between the ages of 18-23. The students were divided into two groups. Group one contained ten students who reported never having received information on HPV or the HPV vaccine from a health care provider. Group two contained 22 students who reported having previously received detailed information on HPV or the HPV vaccine from a health care provider.

Questionnaires were graded based on the number of correct answers with a maximum score of 7. Figure 1 displays the mean pre-intervention score of both groups. There was no significant difference in score between those students who had reported receiving information and those who had not.

Figure 1. Mean scores of pre-intervention questionnaires.

Fifty-five of the original group of 63 students were available to complete the post-intervention questionnaire. All 10 of the students in group one were available to participate in the post-intervention questionnaire. Eighteen of the 24 students in group two were available to participate in the second questionnaire.

Two of the students in group two had received additional information about HPV from their healthcare provider between filling out the first and second questionnaire. For purposes of statistical analysis, these students scores were then included with group one's scores.

One month after the original questionnaire and educational intervention afterwards, both groups of students showed a statistically significant increase in score on the questionnaire about HPV. In group one, students who reported never having received information about HPV or the HPV vaccine from a healthcare provider, there was an increase in mean score of questionnaires after the educational intervention. (Figure 2). There was also an increase in mean score in group two, students who had previously received information on HPV (Figure 3). As a whole, students performed significantly better on the questionnaire one month after a brief educational intervention on HPV (Figure 4). The increase in mean questionnaire score of the group as a whole post-intervention was determined to be statistically significant.

Figure 1

Figure 2. Mean score of surveys for Group one.

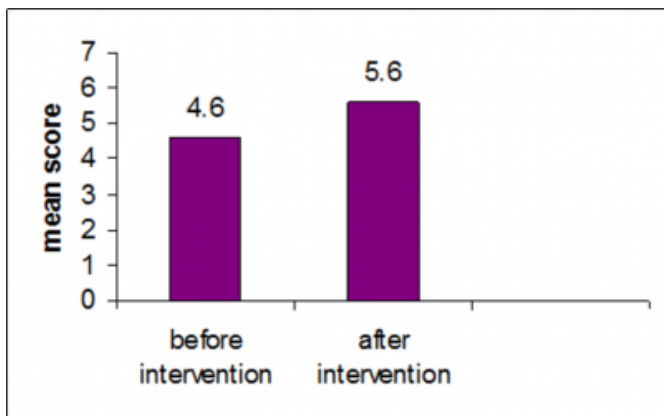


Figure 2

Figure 3. Mean score of surveys for Group two.

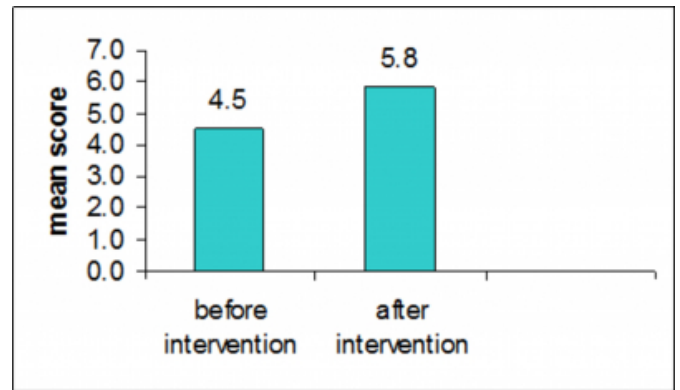
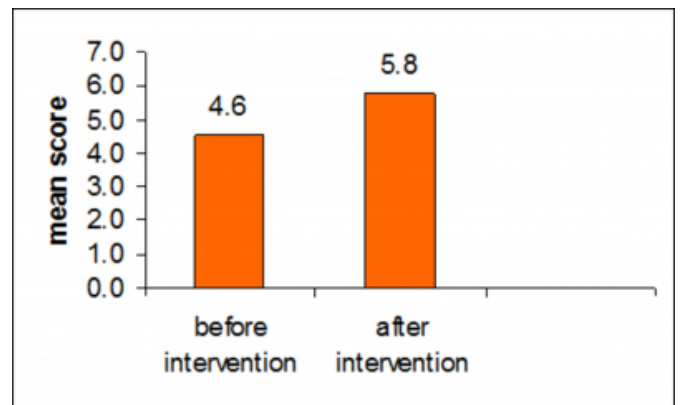


Figure 3

Figure 4. Mean score of all students who participated in pre and post-intervention questionnaires.



DISCUSSION

Female students who participated in this study showed significant increase in their knowledge of HPV one month after a brief educational intervention. This was determined by a rise in post-intervention questionnaire scores as compared to the pre-intervention scores. The results of this study were consistent with Lambert's study done in 2001, "College Students' Knowledge of Human Papillomavirus and Effectiveness of a Brief Educational Intervention" in which both male and female college students scored significantly better on HPV related questions three months after an educational intervention (7).

The intervention that was done in the classroom could be easily replicated by a clinician in the office. The student's were spoken to only a few minutes during which the importance of HPV knowledge was stressed and basic facts were presented. They were also given a handout containing HPV information and asked to read it. It is not possible to determine if all students read the handout which was

distributed. This is a common obstacle that clinicians encounter.

The women were asked whether or not they had previously received information on HPV or the HPV vaccine from a healthcare provider; however, the two groups showed no significant difference in score pre-intervention. The group was only analyzed as whole when comparing pre and post-intervention scores. The sample size was relatively small, and the study did not further explore the details of these women's previous education from clinicians; however, it should be noted that even those women who reported previously receiving detailed information on HPV from a healthcare provider were not clear on very basic HPV facts. Studying the effectiveness of different patient education tools and techniques would be important in determining the best way to get information through to patients.

All women were between the age of 18-23, chosen to represent conventional college students who entered college directly or soon after high school. Due to the anonymous nature of the survey, it was not possible to determine if there was any difference in HPV knowledge across the age distribution. It was also not possible to individually compare before and after scores.

College major was not asked in the questionnaire, and the relationship between college major and questionnaire scores was not explored. It was known, however, that the students had not taken college classes in which HPV was taught in detail.

A relationship between receiving a previous HPV diagnosis was not explored. Students were not asked whether or not they had received the vaccine due to the fact that other factors may come into play other than desire to receive the vaccine, such as cost.

This study did not explore whether or not HPV education impacts safe-sex practices or compliance with health screenings in female college students. This is an important topic to be explored. It did, however, demonstrate that

female students are not adequately knowledgeable regarding basic facts about HPV and related topics.

This study supports the idea that brief education on HPV can increase knowledge among females in college. If such an intervention can easily be provided in school or a health care setting, it can significantly increase their knowledge base about an infection that is both extremely common and can have a great impact on their health. HPV education should be explored as an inexpensive and easily applied preventative measure for cervical cancer and genital warts.

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