

A University Health Initiative to Increase Human Papillomavirus Vaccination Rates

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ABSTRACT

This article describes an effective quality improvement (QI) initiative at a university student health center intended to increase human papillomavirus (HPV) vaccination rates. A 16-week QI initiative used evidence-based interventions including preventing missed opportunities for vaccination, provision of strong vaccine recommendations, use of patient reminders, and campus-based marketing strategies. Electronic health record reports and feedback surveys provided evaluation. Findings revealed a 13-fold increase in administered vaccines during the intervention period. Provider recommendation was the most significant intervention. This program supports the integration of strategies to impact HPV vaccination rates at a student health center.

Keywords: evidence-based interventions, human papillomavirus, quality improvement, university health services, vaccination

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Human papillomavirus (HPV) is the most prevalent sexually transmitted infection.¹ There are an estimated 14 million new cases of HPV acquired annually in the United States alone, and an estimated \$5 to \$8 billion spent on the treatment and prevention of HPV infection and disease.¹⁻⁴ Research shows nearly every sexually active person will contract at least 1 strain of HPV infection in their lifetime.⁵ Although most HPV infections clear spontaneously, HPV can progress into genital warts and cancer. HPV-related cancer prevalence is reported at 33,000 in the US and represents 4.8% of the worldwide cancer burden.⁶⁻⁸

HPV is a significant health issue facing college students given the increased rates of sexual activity, nationally low HPV vaccination rates, and evidence suggesting HPV infections are highest in the 20- to 24-year-old age group.^{9,10} HPV vaccines have been shown to be effective in prevention against the HPV strains that cause the majority of cervical, oropharyngeal, and anal cancers.^{11,12} HPV vaccines are most effective when administered to the sexually naive, ideally at age 11 to 12 years, but may be given through age 26 for both men and women.¹³ Recommendations by the Advisory Committee on Immunization Practices support HPV vaccination of young adults through age 26.¹³

Despite data to support vaccine efficacy and safety, patient acceptance of the vaccine in the US has been poor. The Centers for Disease Control and Prevention (CDC) reports indicate only 34.5% of women and 2.3% of men aged 19 to 26 have received at least 1 dose of the vaccine.¹⁰ Increasing HPV vaccine rates is a national priority supported by the US Department of Health and Human Services Healthy People 2020 initiative,¹⁴ the President's Cancer Panel 2012,¹⁵ and the American College Health Association.¹⁶

Young adults are subjected to many influences as they begin to make independent decisions regarding vaccination. In this population, research suggests a modest overall awareness of HPV infection and vaccine availability; however, females generally report higher rates of HPV knowledge.¹⁷⁻²¹ Social and peer influences have been shown to impact vaccine acceptance in this population.²²⁻²⁶ Some research suggests sexually transmitted infection avoidance may be a stronger motivator for vaccination than cancer prevention in this population.²⁷

A review of the literature identified effective evidenced-based interventions (EBIs) for increasing HPV vaccination rates at a university health center. Preventing missed opportunities to vaccinate was cited in several studies as a successful strategy.^{15,28}

By increasing provider acknowledgement of HPV vaccine history at every clinical visit, gaps in HPV vaccine history can be readily identified and addressed during the encounter. Health care provider delivery of a strong HPV vaccine recommendation has been found to be 1 of the most powerful tools to motivate vaccine acceptance.^{18,27,29-33} Recommendations can be tailored to address personal values influencing vaccine decision-making practices. Another effective tool that has been used are patient reminders to achieve timely vaccine series completion.³⁴⁻³⁶ Social media and communication technologies have been shown to be effective in generalized college-based immunization campaigns.²⁵

The overarching goal for the project was to increase campus HPV vaccination rates over the 2014 fall semester. Based on the evidence, the interventions selected for this quality improvement (QI) project were the following: 1) prevent missed opportunities to vaccinate by increasing provider acknowledgement of vaccine history, 2) provide a strong recommendation for vaccination at every visit, 3) use patient reminder systems, and 4) implement campus-based marketing strategies.

METHODS

Institutional review board approval was obtained for the QI initiative, which was implemented at an urban public university with an undergraduate enrollment of approximately 7,600 students. Four nurse practitioners (NPs) deliver care at the student health center, which averages 5,000 visits per year. Support staff includes a supervising physician and 2 administrative personnel. The health center uses a college-based electronic health record (EHR) and bills insurance for the reimbursement of visits. EHR-based reminder systems were not used for vaccination efforts before this QI project. Inclusion criteria comprised all student (ages 18-26) visits to the health center with no documentation of HPV vaccine series completion or contraindications for vaccination during the 2014 16-week fall semester.

Prevent Missed Opportunities for Vaccination

At electronic check-in stations, patients were asked the following question at every visit: “How many doses of the HPV vaccine have you received in your

lifetime?” Patients were prompted to click the appropriate box (ie, 0 or I don’t know, 1, 2, or 3). These responses automatically generated a graph in the EHR, resulting in a visual cue for providers. Clinicians were signaled to acknowledge vaccine history by the addition of bold red text added to every EHR template, which read “Patient check-in survey and/or immunization history reviewed at or before the visit.” Providers were instructed to check the appropriate box for each visit: “Yes or No.” Patients not meeting inclusion criteria were excluded.

Increasing the Frequency of Provider Recommendation

Before project launch, clinical staff was educated on the importance of provider recommendations and given guidance on best practices for effective HPV vaccine counseling. An HPV vaccine recommendation scripting tool from the CDC was adapted to assist clinicians with effective communication strategies targeting young adults.³⁷ The tool provided clinicians the ability to deliver targeted messaging without significantly impacting visit times. Providers were instructed to convey strong HPV vaccine recommendations to all patients meeting the inclusion criteria regardless of the reason for the visit. All EHR templates were modified to include highly visible red text that read “Strong HPV vaccine recommendation provided during the visit.” Providers were asked to select 1 of 3 boxes: “Yes, No, or not indicated due to series completion and/or medical exemption.”

Using Patient Reminder Systems

After the initial immunization provision, the provider was instructed to schedule future vaccine visits in the EHR. This automatically triggered text and e-mail reminders to patients delivered through the EHR. Vaccinated patients were tracked in a spreadsheet, and any missed follow-up appointments resulted in the student receiving additional phone and e-mail reminders by administrative staff.

Campus-based Marketing Strategies

Social marketing and communication concepts were used to promote vaccine awareness and availability at the health center through a campus-wide campaign called *Spread Love not Warts*. A student contest helped

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