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Missed opportunities for catch-up human papillomavirus vaccination among university undergraduates: Identifying health decision-making behaviors and uptake barriers

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ABSTRACT

Background: Suboptimal adolescent human papillomavirus (HPV) vaccine rates in the US highlight the need for catch-up vaccination. When teenagers enter college, there may be a shift in healthcare decision-making from parents and guardians to the students themselves. Little is known about factors influencing college students' healthcare decision-making processes.

Study design: We evaluated HPV vaccine decision-making among 18-to-26-year-old college students through a self-administered, anonymous, cross-sectional survey. This survey was distributed to a sample of men and women in classroom settings at two universities. Categorical data comparisons were conducted using Chi-square and Fisher's exact tests. Multivariate Poisson regression was used to model initiation of HPV vaccine and compute prevalence ratios while controlling for key influential covariates at the 0.05 alpha level.

Results: A total of 527 students participated (response proportion = 93.1%). Overall, 55.8% of participants received the HPV vaccine. Encouraging conversations with doctors and/or parents/guardians were identified as one of the most influential factors to increase vaccine uptake. Among students who received encouragement from both a doctor and parent, 95.8% received the vaccine. Campaigns about cancer prevention were viewed as more influential than those that focus on preventing genital warts. Approximately one-third of students indicated they didn't know where to get the HPV vaccine. Women were more likely to report that their parents would not let them get the HPV vaccine compared to men (26.7% vs. 2.3%). The majority of students (77.3%) indicated their parents were sometimes, equally, or mostly involved in making decisions about receiving vaccines (other than flu).

Conclusion: Students' decision-making is greatly influenced by their parents; therefore, interventions for this population should work to increase students' control over decision-making while also addressing parental concerns.

1. Introduction

Human papillomavirus (HPV) is the most common sexually transmitted infection with about 79 million Americans currently infected [1]. Half of US adolescents and young women acquire HPV within 3 years of first sexual intercourse [2,3]. HPV can cause genital warts and cervical, vulvar, vaginal, penile, anal, and oropharyngeal cancers, which contribute nearly 5% of all cancers in the US [4]. HPV vaccines are recommended for males and females from age 11 or 12 through age 26 [5].

Adolescent HPV vaccine coverage in the US is much lower than coverage for other recommended vaccines, including tetanus-diphtheria-acellular pertussis [Tdap] and meningococcal conjugate vaccine [MenACWY] [6]. In 2015, coverage with ≥1 HPV vaccine dose was 63% among females and 50% among males [6]. HPV

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vaccine coverage in the US lags that of other countries, with ≥1 dose coverage of 86% among females and 79% among males in Australia [7] and three-dose coverage of 86% among females in the United Kingdom [8]. Low HPV vaccination rates highlight the need for effective catch-up vaccination strategies for individuals over age 13, outside of the primary recommended schedule. Sexual onset and activity often increases once teenagers enter college which places them at higher risk for acquiring HPV [9]. Since vaccine introduction, 4vHPV prevalence among US women ages 20–24 decreased to about 7%, and research suggests that catch-up vaccination programs can be cost-effective and beneficial [10–13]. However, while some colleges offer HPV vaccine, active catch-up campaigns are not as common as promotion activities for younger adolescents.

Many studies have sought to identify correlates of HPV vaccination and predict behaviors by focusing on established constructs and exploring vaccine knowledge, attitudes, practices, acceptance, and uptake among college students [13–19]. Studies exploring parental and/or physician attitudes and knowledge have identified physician recommendation and parental approval as strong predictors of vaccine uptake, however, many studies have focused only on adolescent females [13,16,20–24]. Although some barriers to HPV vaccination have been identified, research on the level of autonomy and control over decision-making among young adults is still limited. When teens enter college, many move away from their parents/guardians who may have had roles in influencing their healthcare decisions. Determining which modifiable or influencing factors lead some young adults to get vaccinated is a sizable gap in current literature [22]. Given that the HPV vaccine is available at about 72% of college and university health centers nationwide, often at reduced cost or for free depending on students' insurance, it is important to understand why students choose not to receive the vaccine to develop catch-up vaccination programs to address barriers and increase vaccine uptake [25].

We sought to identify key barriers, influencing factors, and message framing preferences regarding the HPV vaccine decision-making process among 18-to-26-year-old college students. We assessed the rationale for students' HPV vaccine status, especially among those who recently entered college and were unvaccinated. Identifying when this population begins to take control of their own decision-making and the extent to which they rely on others to influence these decisions is crucial for effective public health interventions.

2. Materials and methods

2.1. Survey

This cross-sectional study utilized a self-administered HPV Vaccine and Decision-Making Behaviors Survey in classroom settings at two universities. Each university's Institutional Review Board approved the survey, and data collection occurred between October and November 2014. The survey was anonymous and no personally identifiable information was collected. As written documentation of consent would have compromised confidentiality by allowing responses to be traced back to students, we acquired a waiver of signed informed consent. Study participants did not receive any school credit and were not monetarily compensated. Participants received a stress ball as a thank you gift for assisting with the study.

Questionnaire items were adapted from previous research and validated instruments on health decision-making, vaccine behavior, and message framing and guided by the Health Belief Model, the Transtheoretical Model, and the Theory of Planned Behavior [15,26–34]. The 50 item questionnaire focused primarily on HPV vaccination and also included items relating to personal health history and behaviors (including vaccination history), sexual health history and behaviors, and factors associated with healthcare decision-making. Demographic items such as class level, age, gender, race/ethnicity, and income level were also included.

The questionnaire was pilot tested to ensure content was appropriate and understandable for the target population by six women and four men with an average age of 23 years (range: 18–27 years). Participants took an average of 15.3 min to complete the questionnaire (range: 10.5–21 min). Participant feedback was very positive with only minor changes requested. Subject matter experts also reviewed the questionnaire to further support face validity of survey items. No survey data was collected from pilot test participants.

2.2. Study population and recruitment

The study population primarily consisted of undergraduates (99.4%) at an urban private religious-affiliated or a rural public university in Georgia. To be included in the study, participants had to be at least 18 years of age, a currently enrolled student at the institution, and able to read and understand English.

After obtaining a list of courses at each university, we contacted a sample of professors of courses with more than 50 students and asked if they would allow time during their course for students to complete the questionnaire. Enrollment was not limited to a specific ethnic or racial group, and there were no plans to monitor equitable recruitment of subjects. During regularly scheduled class times, research personnel verbally described informed consent guidelines (paper copies were also distributed), distributed surveys to students, and promptly collected them via a drop box. To investigate the continuum of decision-making practices from teens to young adults, we targeted introductory level courses selected from a variety of subjects including mathematics, linguistics, sociology, psychology, biology, religion, and political science.

2.3. Statistical analysis

The total number of completed surveys needed was 402 based on computations utilizing a response proportion of 50% with a 95% confidence interval (CI) of ±5% with 80% power [35]. Since the most conservative response proportion of 50% was used, a sample size of 402 was sufficient to evaluate any response proportion more extreme than 50%.

Data was entered into and analyzed using IBM SPSS Statistics for Windows, Version 22.0 (Armonk, NY) and SAS 9.4 (SAS Institute, Cary NC). Categorical data comparisons were conducted using Chi-square and Fisher's exact tests. Multivariate Poisson regression was used to model initiation of HPV vaccine and compute prevalence ratios while controlling for key influential covariates at the 0.05 alpha level [36]. Models were stratified by gender due to a priori decisions to account for initial gender-specific vaccine recommendations. Although good precision was achieved for a large overall sample, stratifying by gender reduced the precision of the CI estimates.

The primary outcome of HPV vaccine receipt was dichotomously measured by participants indicating they had initiated the vaccine series and received at least one dose (initiators) or had not received any doses of the vaccine (non-initiators). Vaccination intentions of non-initiators were measured by participants indicating whether they 'plan to get', 'don't plan to get', or were 'undecided' about receiving the vaccine within the next year. As only ten participants reported they 'plan to get' the vaccine, bivariate comparisons of demographic and influential characteristics by intention among non-initiators are only presented for those who indicated 'don't plan to get' or 'undecided'.

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