

Research Article

Parental Attitudes toward Human Papilloma Virus Vaccine Participation of Adolescent Daughters in a Rural Population

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Key Points

- This pilot study provides information regarding parental attitudes toward Human Papilloma Virus (HPV) Vaccine participation among their adolescent daughters in a rural community with low socioeconomic status (SES).
- HPV vaccination in adolescent females was significantly associated with having been recommended the vaccine by a physician or pediatrician, having insurance that provided cost coverage for the vaccine, and having easily accessible health care.
- Lack of HPV vaccine participation was associated with lack of knowledge about the vaccine, hesitancy due to a concern about vaccine safety, or that the adolescent was perceived by the parent to be too young to have the vaccine.

ABSTRACT

Human Papilloma Virus (HPV) is the most common sexually transmitted infection (STI) in the United States (US), and currently impacts approximately 80 million people. Approximately 14 million new individuals are infected with HPV annually, half of which are between the ages of 15-24. A survey was conducted among parents and guardians whose adolescent daughters attended a large local rural high school to determine factors associated with HPV vaccine participation. The majority of participants were African American (n=39, 90.7%). Most had completed at least a Bachelor's degree (n=23, 55.5%); and the most frequently reported income level was between $30,001 and $50,000 (n=18, 41.9%). Most parents reported that their daughter had participated in the HPV vaccine (n=30, 70.0%). HPV vaccine participation was significantly associated with having an insurance plan that provided coverage for the HPV vaccination (X^2=4.35, df=1, p<0.037), having easily accessible healthcare (X^2=3.84, df=1, p<0.050), and having a physician recommend the vaccine (X^2=14.00, df=1, p<0.001). Though not significant, a positive trend was found between increasing levels of household income and increased percentages of vaccine participation. Among those who reported that their daughters participated in HPV vaccination, 93.0% reported that that they did so to prevent cervical cancer. Among those who did not participate, the most often cited reasons were that the parents/guardians did not know about the availability of the vaccine, or they knew too little about the vaccine (46.2%). Other reasons were that parents/guardians perceived that their daughter was too young (15.4%), they thought the vaccine was too new (15.4%), or they thought the vaccine was not safe (23.0%). Results from this pilot study will be used to inform educational and policy decisions at the local level to improve parental knowledge and attitudes toward HPV vaccination, and to increase vaccine uptake among adolescents in rural areas who are of low socioeconomic status.

Keywords: Human papilloma virus; Papilloma virus vaccines; Parents; Social class; Sexually transmitted diseases

Introduction

Human Papilloma Virus (HPV) is the most common sexually transmitted infection (STI) the United States (US) and currently impacts approximately 80 million people [1]. Approximately 14 million new individuals are infected with HPV annually, and approximately half of those infected are between the ages of 15 and 24 [2]. HPV lives in squamous epithelial cells that make up mucosal skin surfaces. Many individuals who contract HPV do not develop symptoms. The most common cancer associated with HPV is cervical cancer. Approximately 12,000 cases of cervical cancer occur annually among women in the US, 4.000 of which result in death [3]. However, approximately 32,500 men and women develop an HPV-associated cancer as a result of HPV infection. In addition to cervical cancer, HPV-associated cancers may include cancer of the vagina, and vulva in women, and penile cancer in men. Both men and women experience HPV-associated anal and oropharyngeal cancers. The HPV vaccine can prevent approximately 32,000 of these cancers annually [1].

Primary prevention against HPV helps to reduce the individual risk of contracting HPV and developing HPV-associated cancers [4]. Further, primary prevention reduces the economic and societal burden of HPV at the community and population level. Primary prevention for HPV consists of sexual risk behavior reduction, and the HPV vaccine. Despite the availability of the HPV vaccine, US HPV vaccination rates fall well below the national objective of 80.0% [5]. The HPV vaccine is recommended for females through age 26 and males through age 21 [1]. Currently, the Centers for Disease Control and Prevention (CDC) recommends vaccination between ages 11-12 for both males and females. As of 2016, the vaccine distributed in the US protects against 9 strains of the HPV virus (6, 11, 16, 18, 31, 33, 35, 45, 52 and 58) that are most often associated with either genital warts or cancer [6,7].

In 2016, in the state of Mississippi, only 33.9% of females and 24.5% of males ages 13-19 had received the complete HPV vaccine series, this in a state that boasts one of the highest vaccination rates in the nation for other vaccines received in childhood [1].

Little is known about predictors of HPV vaccine participation among rural individuals with low Socio-Economic Status. This study provides results from a pilot survey that collected information about rural and economically disadvantaged parental attitudes toward HPV vaccination participation for their female adolescent children.

Methods

Participants

In order to be eligible to participate in the study, participants had to be over 18 years old, be the parent or legal guardian of a female student who currently attended the local large rural high school that served ninth through twelfth grades in the region, and be able to receive an email link to the study survey.

Procedure

Before beginning the study, permission was sought from both the superintendent's office of the local public school district and the principal of the local high school. The study protocol was also approved by the University of Southern Mississippi's Institutional Review Board. After receiving approval, the principal of the high school distributed an anonymous questionnaire developed in Qualtrics via an email link to all potential study participants that met the eligibility requirements outlined above [8]. The survey consisted of 22 items that collected information from parents and legal guardians of female students at the priority high school regarding demographic information, socio economic status, and attitudes and behaviors associated with the HPV vaccination for adolescent females. The survey link was sent to parents or legal guardians of female students who attended the local high school participating in the study, thus a convenience sample approach was utilized. Study eligibility was further verified through survey questions which determined the age of the survey respondent to ensure that no minors participated in the study, and another question that verified that the respondent was the legal guardian or parent of a female child in the school in grades nine through twelve. The survey remained available for two-weeks to allow all interested participants time to complete it.

All data were analyzed using SPSS Version 23 [9]. Univariate analysis was conducted by calculating frequencies and percents in each category for relevant variables. Bivariate Pearson Chi-Square (X^2) analyses were conducted to determine if categorical independent variables were significantly associated with vaccine participation. A logistic regression analysis was conducted to model the relationship between the independent variable (vaccine participation) and factors significantly associated with vaccine participation at the bivariate level.

Results

A total of 60 parents/legal guardians completed the survey instrument; however, only 43 of the 60 respondents provided information regarding their daughter's participation in the HPV vaccine. Descriptive statistics can be found in Table 1. The majority of participants identified as African American (n=39, 90.7%). Most participants had completed at least a Bachelor's degree (n=23, 55.5%); and the most frequently reported income level was between $30,001 and $50,000 (n=18, 41.9%). Most parents reported that their daughter had participated in the HPV vaccine (n=30, 70.0%). Approximately 46.5% of parents'/guardians' daughters were recommended by their physician or pediatrician to participate in HPV vaccination; and 72.1% of parents/guardians reported that the vaccine would be covered under their current insurance plan. Further, 69.8% of parents/guardians in the study reported that healthcare was easily accessible for their families.

Among those who reported that their daughters participated in HPV vaccination, 93.0% reported that that they did so to prevent cervical cancer. Among those who did not participate in HPV vaccination, the most often cited reason was that the parents/guardians did not know about the availability of the vaccine, or they knew too little about the vaccine to participate (46.2%). Other reasons that parents/guardians reported for their daughter not participating in HPV vaccination was that they felt their daughter was too young (15.4%), they thought the vaccine was too new (15.4%), or they thought the vaccine was not safe (23.0%).

There were several factors associated with HPV vaccine participation at the bivariate level of analysis. Though none of the demographic variables significantly predicted vaccine participation, there were several variables that were significantly associated with parents'/guardians' report of HPV vaccine participation (Table 2). For example, having an insurance plan that provided coverage for the HPV vaccination was significantly associated with HPV vaccination participation (X^2=4.35, df=1, p<0.037). Among those parents/guardians reporting that they had insurance that covered the cost of the HPV vaccine, 82.1% had a daughter who was vaccinated against HPV. Additionally, having easily accessible healthcare (X^2=3.84, df=1, p<0.050),

Table 1: Characteristics of Survey Participants and Factors Relevant to HPV Vaccine Participation.

Category	n (%)
Race	
Caucasian	39 (90.7)
African American	4 (9.3)
Education	
High School Diploma or less	4 (9.3)
Some College through Associate's Degree	16 (37.2)
Bachelor's Degree or above	23 (53.5)
Annual Income	
$0 - $30,000	11 (25.6)
$30,001 - $50,000	18 (41.9)
$50,001 - $80,000	8 (18.6)
$80,00 and above	6 (13.9)
Daughter Participated in HPV Vaccine (Yes)	30 (70.0)
Reasons Parents/Guardians Participate in HPV Vaccination (n=30)	
To prevent cervical cancer	40 (93.0)
Cervical cancer history in family	3 (7.0)
Reasons Parents/Guardians Don't Vaccinate against HPV (n=13)	
No knowledge or not enough knowledge about the vaccine	6 (46.2)
Thought the vaccine was too new	2 (15.4)
Thought daughter was too young	2 (15.4)
Thought the vaccine was unsafe	3 (23.0)
Miscellaneous Factors	
Percentage of providers recommending HPV vaccination to parents/guardians	20 (46.5)
HPV vaccine Covered by insurance plan	31 (72.1)
Reported that health care was easily accessible	30 (69.8)

Table 2: Significant Predictors of HPV Vaccine Participation at the Bivariate Level.

Independent Variable	Percent Vaccinated	Chi-Square Value	Df	P-Value
Insurance Coverage for HPV Vaccine	82.1%	4.353	1	0.037*
Easily Accessible Health Care	78.6%	3.41	1	0.050*
HPV Vaccination Recommended by Physician or Pediatrician	85.7%	14.727	1	0.001*

and having a physician recommend the HPV vaccine (X^2=14.00, df=1, p<0.001) were both significantly associated with HPV vaccine participation. Among those that reported that health care was easily accessible, or that the vaccine was recommended by their daughter's physician, 78.6% and 85.8% also received the HPV vaccine respectively. Though not statistically significant, a general trend was observed between income level and vaccine participation (Table 3). Results indicate that the higher the income level of the respondent, the more likely they were to vaccinate their adolescent daughters against HPV. A logistic regression analysis was conducted to model the relationship between the independent variable (vaccine participation) and factors significantly associated with vaccine participation at the bivariate level. The only variable that remained in the complete model after backward step-wise logistic regression modeling was the indicator that a physician or pediatrician had recommended the vaccine to the participant for her daughter (OR=24.0; 95%CI (3.68, 156.74)).

Discussion

In this pilot study, the data show a trend in the association between household income and HPV vaccination participation. As household income increased, vaccine participation increased. This was interesting in that the federal Vaccines for Children program provides vaccine cost coverage for those under 19 years or under who are uninsured, Medicaid-eligible, American Indian or Alaskan Native [10]. Thus, cost should not be a barrier to vaccine participation. For those who do have insurance, it is possible that the individual financial responsibility related to the amount of a deductible or co-pay could be cost prohibitive. In

Table 3: Trend in Vaccine Participation and Rising Income Level of Participants.

Participated in HPV Vaccination	$0-$30,000	$30,001-$50,000	≥ $50,001
Yes n (%)	4 (44.4)	11 (73.3)	11 (91.7)
No n (%)	5 (55.5)	4 (26.7)	1 (8.3)
Total	9 (100.0)	15 (100.0)	12 (100.0)

the pilot study, data indicated that the main barrier to vaccine participation was lack of knowledge about the vaccine and a perceived concern among participants that the vaccine was unsafe. Other studies have shown that a lack of knowledge about the vaccine can be detrimental to vaccine participation. In a study conducted in the United Kingdom, it was theorized that a vaccination coverage rate of 80% might be possible if parents were knowledgeable about the vaccine and perceived that it was safe [11]. However, this was a study conducted in the UK which has a radically different health system than does the US. One study in the US that examined the association between changes in parent's attitudes toward the HPV vaccine and eventual vaccine participation by their adolescent children, measured the parental attitudinal change in HPV vaccine hesitancy via the Carolina HPV Immunization Attitudes and Beliefs Scale. The study found that for every one unit that hesitancy was decreased, there was a 4.9 times higher odds that the adolescent received the next dose of the HPV vaccine [12].

Studies consistently show that African American parents are less likely to encourage HPV vaccine participation for their adolescent children [13]. This pilot study was conducted in a rural high school, and African American parents made up approximately 90.0% of the sample in the pilot study, thus the study sample may not be representative of the general population.

The methodology of the study consisted of an online survey distributed through an email link via a convenience sample approach. Those parents without access to the internet through a computer or mobile device would have been unable to participate. Additionally, it should be noted that those with lower household incomes may have been less likely to participate since they may not have access to internet in their homes. Our sample, however, did have representation from various income levels, but it must be noted that this survey modality could have impacted the generalizability of the study results.

Conclusion

This pilot study provided valuable information about factors that influenced rural, low-income parents to encourage HPV vaccine participation by their daughters. Increased understanding of factors associated with HPV vaccination in low-income minority groups can guide interventions to increase coverage and serve to guide policy decisions in the study area.

Ethical Approval

In order to ensure that the study maintained the highest ethical standards, a human subjects review application was presented to the Institutional Review Board of the University of Southern Mississippi (protocol number 15040608) and was approved prior to participant enrollment.

Conflicts of Interest

The authors state that there are no conflicts of interest; this includes ownership of shares, consultancy, speaker's honoraria or research grants from commercial companies or professional or governmental organizations with an interest in the topic of the paper.

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