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(RESEARCH ARTICLE)

Provider recommendations for human papillomavirus vaccine (HPV) among adolescent males in Southwest Georgia counties and the associated HPV prevalence in this population

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Abstract

The study examines variation of providers' behavior in recommending the Human Papillomavirus (HPV) vaccine to young male adolescents (aged 11-12), middle male adolescents (aged 13-17) and late male adolescents (aged 18-26) in Southwest (SW) Georgia. Upon IRB approval, secondary data were obtained from Albany Area Primary Care for a paper-based survey that was conducted in 2014 using a representative random sample of family physicians (n=12), pediatricians (n=6), and nurse practitioners (n=33). The survey had a response rate of 76% and the researcher used descriptive statistics, t tests and ANOVA to describe the pediatricians' (Peds), nurse practitioners' (NPs), and family physicians' (FPs) recommendations to HPV vaccinations in SW GA. Statistical analysis show barriers such as healthcare providers' and parents' discomfort with the vaccination of pre-teens when it concerns a sexually transmitted disease, lack of awareness to the role that males play in the spread of HPV, absence of government mandates, and non-completion of the three-dose series of vaccination due to financial or logistical reasons. Provider specialty, age, ethnicity, and reported barriers were significantly associated with recommendations and association to HPV prevalence. Policy level intervention, perceived barriers and support to HPV vaccination to providers may drive decisions about HPV vaccine uptake and completion of vaccination series.

Keywords: Human Papilloma Virus; HPV Vaccines; Rural Health; Cancer causing virus; Sexually transmitted virus

1. Introduction

Human papillomavirus (HPV) is a sexually transmitted infection (STI) that is very common in the United States and that has been recognized as one of the most dangerous viruses as it is linked to various genital-related health problems in males (CDC, 2013). It is responsible for approximately 4,000 deaths annually within the country, and it is causally linked to cancers in areas such as the anus, genitals, and oropharynx (Schiffman et al., 2011). Each year, 9,000 males in the United States contract HPV-related cancer (Dunne et al., 2014). In 2008, the vaccine targeting HPV, Gardasil™, entered the market and was targeted at males aged between 9 and 26 years. The Centers for Disease Control Advisory Committee on Immunization Practices (ACIP) subsequently recommended vaccination of males between 9 and 26 years of age (CDC, 2013). In 2009, another vaccine, Cervarix, was introduced into the market (CDC, 2010). Despite a wave of federal and state policy initiatives aimed at promoting the vaccine's use, a review of pertinent literature shows that there exist several barriers to the vaccination efforts. Research indicates that primary healthcare providers' recommendations are a key factor for vaccine uptake among adolescents (Vadaparambil et al., 2011). The purpose of this paper is to describe healthcare providers' recommendations to HPV vaccine to adolescent males.

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2. Current Situation

The HPV virus is responsible for over 70% of cervical cancer cases. The HPV virus vaccination is currently recommended for girls 9 to 12 years of age and can also be administered for ages 13 to 26 (CDC, 2012). It is more effective if given before the girls' first sexual contact. Absent vaccination, the only recommended and sure way of preventing infection with the HPV virus is by total abstinence from sexual intercourse since the virus can be transmitted by the areas not covered by a condom even if a condom is used. As such, concerted efforts ought to be employed to avoid infection by vaccinating men as well as women (Shi, 2008). Currently the emphasis on HPV vaccination is skewed towards females, but this research proposes a balanced approach by targeting adolescent males for HPV vaccination as well.

The many opposing opinions about HPV vaccinations can affect funding and research efforts concerning the effects of HPV among males (Siu, 2014). In fact, it is estimated that 14 million US citizens are infected with this virus annually. The number of people suffering from the disease at any given time is about 70 million. Of the 150 identified strains of the HPV, 40 are carcinogenic and believed responsible for causing different types of cancers such as cervical cancer, as well as some less common types of cancers such as cancers of the anus and vagina (Stocker, Dehnert, Schuster, Wichman, & Delere, 2013).

Two types of vaccines against HPV infections are currently available. These include bivalent (Cervarix) and quadrivalent (Guardasil) vaccines. These vaccines are totally effective against strains 16 and 18 which are the most potent causative agents of cervical cancer. Usually three shots of the vaccine are given to protect against HPV. These shots are administered as a series over a period of six months. Immunity against cervical cancer in women is provided using Cervarix and Gardasil. Gardasil is also effective in preventing genital warts, and vaginal, anal, and penile cancers. Cervarix, however, is effective only against the strains of HPV that cause cervical cancers. The vaccines are effective when given to preteen boys and girls before they become sexually active. As such, the vaccine is currently recommended for preteen boys and girls (Vadaparampil et al., 2011).

3. Research Setting

Albany Area Primary Health Care, Inc. is an affiliate of the Georgia Association for Primary Health Care (GAPHC) and also a Federally Qualified Health Center (FQHC). It is located in Albany, GA, and provides healthcare services to rural and underserved communities in Southwest GA.

4. Research Questions/Hypotheses

The focus of this study will be on providers' tendency to recommend HPV vaccine to early male adolescents (ages 11-12), as evidence indicates that this is the best age to introduce the HPV vaccine to ensure long-term effectiveness.

4.1. Research Question A

Are healthcare providers' rates of recommending HPV vaccination for males aged 11 to 12 years old higher than those of males aged 13 to 17 years old?

4.1.1. Null Hypothesis

No difference exists between healthcare providers' prevalence of recommending HPV vaccines to either early (ages 11-12) adolescent or middle (ages 13-17) adolescent males.

4.1.2. Alternate Hypothesis

A difference exists between the healthcare providers' prevalence of recommending HPV vaccines to early (ages 11-12) adolescent and middle (ages 13-17) adolescent males.

4.2. Research Question B

Are healthcare providers' rates of recommending HPV vaccination for middle adolescent males (ages 13-17) higher than those of late adolescent (ages 18–26 years) males?

4.2.1. Null Hypothesis

No difference exists between healthcare providers' prevalence of recommending HPV vaccines to either middle adolescent or late adolescent males.

4.2.2. Alternate Hypothesis

Differences exist between healthcare providers' prevalence of recommending HPV vaccines to middle adolescent and late adolescent males.

4.3. Research Question C

Are healthcare providers' rates of recommending HPV vaccination for early adolescent males (ages 11-12) higher than those of late adolescent males (ages 18-26)?

4.3.1. Null Hypothesis

No difference exists between healthcare providers' prevalence of recommending HPV vaccines to either early adolescent (ages 11 -12) or late male adolescent males (ages 18-26).

4.3.2. Alternate Hypothesis

Differences exist between healthcare providers' prevalence of recommending HPV vaccines to early adolescence (ages 11-12) and late adolescence males (ages 18-26).

4.4. Research Question D

Is there a variation in rates at which specialist healthcare providers' (FPs, NPs, Peds) recommend HPV vaccines?

4.4.1. Null Hypothesis

No difference exists between specialist healthcare providers in their prevalence of recommending HPV vaccines to patien.

4.4.2. Alternate Hypothesis

Differences exist between specialist healthcare providers in their prevalence of recommending HPV vaccines to patients.

4.5. Research Question E

Are healthcare providers' encountering perceived barriers in recommending HPV vaccine to adolescent males?

4.5.1. Null Hypothesis

No perceived barriers exist among healthcare providers' prevalence of recommending HPV vaccines to adolescents males

4.5.2. Alternate Hypothesis

Perceived barriers exist among healthcare providers' prevalence of recommending HPV vaccines to adolescents males.

4.6. Research Question F

Is there variation in recommending rates by demographic characteristics of the provider?

4.6.1. Null Hypothesis

There is no variation in recommending rates by demographic characteristics of the provider.

4.6.2. Alternate Hypothesis

There is variation in recommending rates by demographic characteristics of the provider.

5. Delimitations

This study uses secondary data obtained from a local federally qualified health center (Albany Area Primary Care-AAPC) that operates in several counties in Southwest Georgia. The sample size is small and the responses may be based on regional socio-cultural and socio-economic factors, along with other regional factors.

6. Significance of the Study

The quest to develop social awareness of the dangers of HPV has been assumed by different health organizations in the United States. The lack of awareness concerning the danger of HPV to men has led to the deaths of many unsuspecting people who succumb to various forms of HPV-related infections (Jemal et al., 2011). The burden of HPV-related illnesses among males is associated with primary care healthcare providers such as pediatricians (Peds), nurse practitioners (NPs), and family physicians (FPs) missing clinical opportunities to recommend HPV vaccination (Sudenga, Royse, & Shrestha, 2011).

The study also helps to compare the effectiveness of various HPV vaccines with that of other methods of HPV prevention. These methods include use of condoms, abstinence, and monogamy. According to the Youth Risk Behavior Survey (YRBS), in 2013, 46.8% of high school teenagers were sexually active, with 15% of these reporting four or more partners (CDC, 2014). With the study revealing the various adverse consequences of missed vaccination opportunities, adequate measures will be taken to reduce instances of missed vaccination opportunities. The study provides relevant information that can be used to curb HPV-linked illnesses (Gamble et al., 2010). Mandatory HPV vaccination in Australia has greatly reduced the prevalence of genital warts in teenagers (Ali et al., 2013). Following this logic, it is likely that implementing HPV vaccination for adolescents in southwest Georgia would immediately begin to reduce the incidence of adolescent genital warts here as well. However, the benefits of reducing HPV-related penile, anal, and cervical cancers may take decades to be revealed (CDC, 2013).

The study will also identify ways through which these barriers can be overcome. Such solutions include adoption of relevant legislation and government policies, financial support from the government, and health workers informational drills (Goldstein, 2010). As such, the study directly suggests the solution to missed medical opportunities by identifying support that will enhance the goal of increasing primary healthcare providers' rate of recommending HPV vaccination among adolescent males.

By revealing the relationship between the likelihood of the healthcare providers to recommend HPV vaccine and the prevalence of HPV-related diseases in a rural community of southwest Georgia, this study can help to accomplish the public health goal of preventing poor health outcomes among the subject population (Gostin & DeAngelis, 2007). Basically, intervening and seeking to prevent a disease is the foundation of public primary health. In addition, the study will generate knowledge which when disseminated to all the stakeholders could help bring about a healthier society (Gudeman, 2007).

The study will be used as a road map that will set a guide for the development, implementation, and evaluation of HPV-related health issues. In addition, the study will be used to understand the current behavior of healthcare providers in recommending HPV vaccines to young patients (Hoover, Carfioli, & Moench, 2000).

HPV infection is considered the most common sexually transmitted infection, with half of the US population contracting it at some point in their lives. As it is transmitted through sexual contact, its incidence is very high in sexually active people, especially among men who have sex with other men. Statistically, 50% or less of heterosexual men, 61% of HIV-negative homosexual men, and 93% of HIV-positive homosexual men have HPV infection (Brewer, Ng, McRee, & Reiter, 2010).

Human papilloma virus (HPV) replicates in the squamous epithelial cells of the cervix, anus, and tonsils. It can establish infection only in the keratinocytes of the skin and the mucous layer. Most infections are asymptomatic; however, in a few cases infection can lead to warts and/or cancers of the cervix, vagina, vulva, penis, oropharynx, and anus. Risk factors for infection include more than one sexual partner, use of oral contraceptives, smoking, and alcohol consumption. Use of condoms and circumcision can reduce HPV infections (Crosignani et al., 2013).

The majority of anal and penile cancers in men worldwide are associated with HPV infection. Gay men infected with HPV are 44 times more likely to get anal cancer. Gay men who are both infected with HPV and HIV positive are 60 times more likely to develop anal cancer (Newman, Logie, Doukas, & Asakura, 2013). Heterosexual men infected with HPV can

increase their sexual partner's risk of developing cervical cancer. Hence, protection from HPV for men in the form of vaccination becomes essential. However, for a number of reasons, vaccination is recommended only for females and not much priority is given to vaccination for males. A number of school-based immunization programs have been put in place due to the alarming rates of cervical cancer; however, all of these programs are targeted to adolescent girls. Including boys in school-based vaccination programs is presently considered cost-ineffective and unnecessary (Newman et al., 2013).

Preventing HPV infection can be accomplished largely through the use of two vaccines – the quadrivalent vaccine Gardasil (Merck), and the bivalent vaccine Cervarix (GlaxoSmithKline). The HPV risk-types that are targeted by Gardasil are HPV-16, -18, -6, and -11, whereas Cervarix targets only HPV-16 and -18.

Both of the vaccines have proven highly effective in preventing adenocarcinoma in-situ (AIS) in women; additionally, Gardasil also prevents genital warts, vulvar and vaginal intraepithelial neoplasia grades 1-3, and high-grade anal disease in men. However, Cervarix is cheaper compared to Gardasil and also offers longer protection – 8.4 years, compared to 6.4 years for Gardasil. Studies have also found that Cervarix can generate higher antibody titers compared to Gardasil. Despite all this data in favor of Cervarix, Gardasil is preferred due to its wider range of protection (Ma et al., 2012). The safety and efficacy of both vaccines has been very well documented, and both afford protection against 80% of all cervical cancers (Hung, Ma, Monie, Tsen, & Wu, 2008).

Critical factors in HPV vaccination include immunogenicity, safety, and clinical significance (Crosignani et al., 2013). The current option for HPV vaccination in men is the quadrivalent vaccine, Gardasil, which has been licensed for use in men since 2009. In 2011, Gardasil was approved by the ACIP for use in male adolescents aged 11-21 years for the prevention of genital warts and anal cancer. This vaccine has been proven to be more than 90% effective in the prevention of HPV infection (Newman et al., 2013).

The literature review on HPV vaccine uptake in male adolescents shows the important association between barriers and supports within primary prevention. Research shows that the primary prevention of HPV among adolescent males largely depends on the attitudes and behaviors of primary healthcare professionals, parents, and the adolescent males themselves. Barriers in any form at any level can lead to hindrances in the proper use of HPV vaccination for men. The primary challenges that exist for healthcare professionals include individual, ecological, and cognitive barriers such as doubt, confusion, and concerns regarding vaccine uptake.

As the nature and extent of these barriers has become apparent through a number of surveys conducted by various public health organizations, a number of organizations have extended their support to overcome these barriers. The greatest and most important barrier is cost, and so support in this direction has resulted in a lot of countries offering the HPV vaccine free of charge to the target population. Primary healthcare providers also play a very important role in recommending the vaccine to eligible patients and addressing their questions regarding HPV infection and vaccination. Other sources of support include state policies, regulatory bodies, and the U.S. National Vaccine Plan. In the age of technology, maintenance of electronic health records and ensuring their security and privacy also go a long way in encouraging HPV vaccination.

The theoretical framework used in this study includes the social cognitive theory (SCT), social ecological model (SEM), and the public health model. The SCT helps generate an interpersonal collective effort in producing the desired result (Bandura, 2001). In the SEM, health-related behaviors are studied with respect to physical, social, and policy aspects (Baral, Logie, Grosso, Wirtz, & Beyrer, 2013). The public health model promotes assessment, policy development, and assurance of public health programs such as vaccination. In addition, it takes into consideration the host, the agent causing the infection, and the environment in which the agent thrives (Horvath, Misra, Epner, & Cooper, 2014). A combination of these models has been used as an evidence-based framework for prevention of HPV infections.

7. Research methods

The study design for this research is cross-sectional and observational, based on secondary source of data.

7.1. Data

Clinical specialty data for HPV vaccine recommendation among adolescent males were drawn from the 2014 profile of rural healthcare providers of all 10 affiliates of Albany Area Primary Health Care, Inc. Albany Area Primary Health Care, Inc. is an affiliate of the Georgia Association for Primary Health Care (GAPHC) and also a Federally Qualified Health Center (FQHC). It is located in Albany, GA, and provides healthcare services to rural and underserved communities in

southwest GA. Questions on perceived barriers and rates of HPV vaccination recommendations were administered as a paper-based survey instrument to a representative sample of 70 clinical specialists (family practice, pediatricians, and nurse practitioners) and completed by 51 healthcare providers. The response rate for the healthcare providers was 76%.

Albany Area Primary Health Care adopted a previously validated survey tool developed by researchers from the Moffitt Cancer Center and tested by Susan Vadaparampil (2009) from a nationwide survey. The research study conducted by Susan Vadaparampil was on HPV intervention. The researchers validated the instrument through two rounds of expert panel review with HPV researchers and clinicians, as well as through interviews with physicians (n = 7) and a pilot study with randomly selected physicians (n = 16) with expertise in this field (Vadaparampil et al., 2011).

7.2. Variables

The research study used variables such as age of male patients, clinical specialties of the respondent health workers, frequency of recommendation for vaccine uptake, frequency of vaccine administration, parent's fears and concerns on the effects of the vaccine being administered. Paired *t* tests and analysis of variance (ANOVA) were used to determine the relationships between provider recommendations to patients and vaccine uptake completion. The primary variables in this research study were the specialty of practice, age of target patients, gender of the practitioners, and race. These variables were analyzed against each other with the independent variable being age, gender, and specialty of medical practice. The main dependent variables were the frequency with which health providers to recommend the HPV vaccine as well as the frequency of administration of this vaccine to the target population of male patients in the chosen age groups.

8. General Demographics of the Target Population

According AAPC, out of this population, data was randomly collected pertaining to adolescents in the age groups of 11-12 years, 13-17 years, and 17 – 26 years. A total representative sample of 15 family practitioners, 17 nurses, and 19 pediatricians were used in this study to collect data on the frequency of HPV vaccine recommendation to their patients in the varying age categories.

8.1. Statistical Analysis

Paired *t* tests and ANOVA were carried out in investigating the statistical differences that exist between the clinical specialties. The research revolves around the recommendation of the HPV vaccine among the various age groups, which in effect means that the primary response in this analysis was health provider recommendations of HPV vaccination. The dependent variables obtained in this research study were based on the Likert-type scale, offered in the questionnaires administered to the various health providers. An assumption was made that responses by the health sector service providers in the sample were representative of the general approach by each of the medical practitioners in dealing with all his/her clients in as far as recommending the HPV vaccine. This recoding was selected as most appropriate as it reflects best practices employed by health providers in recommending the vaccine.

9. Conclusion

Findings suggest missed HPV vaccination opportunities for adolescent males. Perceived barriers and support to HPV vaccination to providers may drive decisions about HPV vaccine uptake and completion of vaccination series. Findings also suggest the need for policy level interventions to increase HPV vaccination among US adolescent males.

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