

What Women in the United States Virgin Islands Still Want and Need to Know About HPV, Cervical Cancer, and Condom Use

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Acknowledgements: This report was supported by grants from the National Institutes of Health, National Center on Minority Health and Health Disparities (# R24-MD0011231), and the University of Wisconsin Milwaukee Undergraduate Research Program.

Abstract

Cervical cancer is an infection-related cancer caused primarily by the human papilloma virus. Sexual behavior is a primary risk factor for contracting the genital type of the HPV. While studies have shown that vertical transmission, horizontal transmission, and transmission of the HPV are possible, they are not common. The incidence of cervical cancer in the Caribbean is the third highest in the world. This report describes the outcomes of a cross-sectional, mixed methods, exploratory study undertaken to examine questions and concerns about HPV transmission, physical examination, cervical cancer screening, and HPV/cervical cancer risk management among a targeted group of single, unmarried women in the U.S. Virgin Islands. Analysis of the data revealed that the women had many questions and concerns about the origin of HPV infection and cervical cancer, HPV and cervical cancer risk factors, HPV and cervical cancer screening, and HPV and cervical cancer prevention and risk management. Results of the study are used to suggest opportunities for nurses to respond to the questions and concerns posed by the women through the University of the Virgin Islands and within community-based settings.

Key Words: cervical cancer, condom use, HPV

Introduction

Cervical cancer, once the most common cause of cancer among women of child-bearing age, ranks as the second most commonly diagnosed cancer and the third leading

cause of cancer death in women worldwide. According to reports disseminated by the American Cancer Society and the World Health Organization, an estimated 555,100 new cases of cervical cancer were expected to be diagnosed, and an estimated 309,800 deaths due to cervical cancer were expected to occur worldwide, during 2007 (American Cancer Society, 2007a; American Cancer Society, 2008a; Boyle & Levin, 2008). The reports also note that the highest incidence rates of cervical cancer worldwide occur in Central America, South America, the Caribbean, Sub-Saharan Africa, and Southern Asia, and that the highest mortality rates of cervical cancer worldwide occur in Africa, Latin America, Asia and India.

Background and Significance

Cervical Cancer: Causation

Cervical cancer is an infection-related cancer caused primarily by the human papilloma virus (HPV) (American Cancer Society, 2008b; National Cancer Institute, 2004). There are more than 100 different types of HPV. Approximately 60 HPV types cause warts on non-genital skin, such as on the hands, arms, knees, shins, feet and face. Approximately 40 HPV types can affect mucous membranes and cause genital warts or low-grade changes, high-grade changes, pre-cancer or cancer in the cervix, vagina, anus, vulva, penis, urethra, mouth, throat, tongue or tonsils. In addition, there are other HPV types that do not cause warts, cancer or symptoms.

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Sexual behavior is a primary risk factor for contracting the genital type of the HPV (National Comprehensive Cancer Network, 2008; Centers for Disease Control, 2007a; Centers for Disease Control, 2007b; International Collaboration of Epidemiological Studies of Cervical Cancer, 2006; Troisi et al., 2007). The genital type of the HPV is usually transmitted skin-to-skin during penetrative vaginal or anal-genital contact. Oral-genital, manual-genital and genital-genital contact can lead to the transmission of the virus. While studies have shown that vertical transmission of the HPV from an infected mother to a newborn, horizontal transmission of the HPV to children following sexual abuse, and transmission of the HPV following contact with infected secretions without sexual intercourse are possible, they are not common (Bergeron, Ferenczy, & Richart, 1990; Carson, Rice, & Best, 1998; Fraiser, 1994; Spence, Franco, & Ferenczy, 2005; Sonnex, Strauss, & Gray, 1999; Winer, Lee, Hughes, Adam, Kiviat et al. 2003).

Women with multiple sex partners have a higher risk of contracting HPV than monogamous women. Other factors that increase a woman's risk of acquiring the HPV infection include early age at first intercourse, having a sexual partner who has had many sex partners, and having sex with an uncircumcised male.

Prevention of Cervical Cancer

Refraining from all sexual contact involving the genitals is the only absolute way to prevent genital infection by the HPV (American Cancer Society, 2009; Centers for Disease Control, 2007a; Centers for Disease Control, 2007b; National Cancer Institute, 2004). Given that complete abstinence is not a desirable or realistic expectation for most adults, other means of reducing risk of acquiring the HPV are recommended. Limiting intimate sexual activity to one, mutually monogamous, uninfected partner will reduce a person's risk of contracting a genital type of the HPV. Limiting the number of sexual partners will, likewise, reduce a person's risk of contracting different strains of the HPV.

Avoiding direct contact with the HPV, which is primarily transmitted by skin-to-skin contact, is deemed to be an effective means of reducing the risk of HPV transmission. Latex condoms have been identified as an effective means for reducing risk of transmitting several sexually transmitted diseases. Consistent and correct use of latex condoms provides some protection against the HPV. However, given that condoms do not cover the vulva, scrotum, perineum, or rectal areas, condoms cannot completely prevent transmission of genital types of the HPV.

HPV and Treatment of Cervical Cancer

In June of 2006, the Food and Drug Administration licensed the first HPV vaccine. The vaccine is indicated for use among girls and women from 9 to 26 years of age for the prevention of cervical cancer, precancerous or dysplastic lesions, and genital warts. While the HPV vaccine does not protect against all types of HPV, it does provide protection against two HPV types which cause 70% of the

cases of cervical cancer (i.e., HPV 16 and HPV 18) and two of the HPV types which cause 90% of the cases of genital warts (i.e., HPV 6 and HPV 11) (FUTURE II Study Group, 2007).

Purpose of the Study

The incidence of cervical cancer in the Caribbean is the third highest in the world (American Cancer Society, 2007). Reducing cervical cancer morbidity and mortality and preventing disease, disability, and death from vaccine-preventable infectious diseases are key objectives of the United States Virgin Islands Department of Health (U.S. Virgin Islands Department of Health, 2003). However, efforts to address cervical cancer prevention, detection, and control throughout the Caribbean tend to be isolated and uncoordinated (Pan American Health Organization, 2003).

Few efforts have been undertaken by clinicians, educators, and researchers within the territory to examine the cervical health needs, concerns, and practices of women in the Caribbean. A study to explore the cervical health needs, concerns, and practices of women in the U.S. Virgin Island was therefore proposed. The study, proposed by researchers, faculty, and students involved in the Caribbean Exploratory Research Center at the University of the Virgin Islands Division of Nursing, was designed to explore factors associated with HPV transmission, physical examination, cervical cancer screening, and HPV/cervical cancer risk management among single, unmarried women in the U. S. Virgin Islands. The long-term objective of the study was to create tailored interventions focused on HPV risk management, cervical cancer prevention, cervical cancer early detection, and cervical cancer control for women in the U.S. Virgin Islands.

Methodology

Design, Sample, and Setting

A cross-sectional, mixed methods, exploratory survey design was used in this study. A purposive sample of adult women from the Virgin Islands was recruited by a team of trained research assistants at community centers, agencies, and public facilities frequented by adult women. Targeted for inclusion in the study were single, unmarried women who were able to communicate in English, who were willing to complete an anonymous self-report survey about HPV, cervical cancer, physical examination and cervical cancer screening practices, and HPV/cervical cancer risk management. The proposed size of the study sample was determined using procedures prescribed by Daniel (2008). Demographic data of residents in the United States Virgin Islands reported by the Census Bureau indicate that 14,085 single, unmarried women from 15 to 44 years of age reside within the United States Virgin Islands (U.S. Census Bureau, 2009). Given that it was not possible to estimate the health behaviors and screening practices of single, unmarried women the *p* value was set at 0.5. The necessary sample size was determined to be 375. A major goal of the Caribbean Exploratory Research Center is to stim-

ulate research with the involvement of faculty, staff, students, and residents from the Virgin Islands in research efforts focused on the elimination of health-related disparities in the U.S. Virgin Islands. Therefore, efforts were undertaken to increase the sample size by 20% and to recruit 450 single, unmarried women into the study.

Instrumentation

Investigator Initiated Survey. A two page investigator-designed survey was used to collect the study data. The survey included forced choice, yes-no, fill-in-the-blank, and open-ended items developed to capture data reflective of participants' demographic characteristics, participation in health education programs, perceived health status, physical examination and cervical cancer screening practices, HPV/cervical cancer risk management, and questions and concerns about HPV and cervical cancer. Seven items were used to elicit data reflective of the participant's ethnic background, age, education, income, marital status, employment status, and insurance status. One item was used to elicit data reflective of their perceived health status. Two items were used to elicit data relative to physical examination and cervical cancer screening. Two items were used to assess participation in health education programs. Four items were open-ended questions used to identify questions and concerns of participants regarding HPV and cervical cancer.

Validity and appropriateness of the interview guide for use among the targeted population were assessed by a panel of experts, including two nursing faculty, two nurse clinicians, and two consumer health advocates, prior to beginning the study.

Recruitment and Data Collection

During the process of recruitment, adult women who were involved in activities at the targeted centers and agencies were approached by the research assistants and informed about the study. The women were given an informational letter which described the study purpose and procedures. Prospective participants were informed that the study would require that they complete a survey in which they would be asked to respond to questions about their health-care practices, HPV, cervical cancer, and HPV/cervical cancer risk management. Prospective participants were informed that the survey would take no more than 10 minutes to complete. Prospective participants were informed that the survey was anonymous and that no names or identifiers that could link them to the data would be recorded. Prospective participants were informed that they would be one of approximately 450 single, unmarried women from the U.S. Virgin Islands participating in the survey. Prospective participants were informed that the findings would be used to design women's health education and outreach programs for women within the U.S. Virgin Islands.

Women consenting to participate in the study were given a survey and an unmarked envelope. After completing the survey, the women were instructed to place the sur-

vey in the envelope, to seal the envelope, and to return the envelope to the research assistant.

Procedures for Data Analysis

All of the data collected during the study were entered into computer databases in two phases. After each survey was coded with a unique survey identification number, the quantitative data reflective of personal demographic characteristics; physical examination and cervical cancer screening practices; and HPV/cervical cancer risk management behaviors was scanned and the data was entered into a Statistical Package for the Social Sciences (SPSS) database (Phase 1). Descriptive and inferential statistics were used to analyze the quantitative data. The questions and concerns relevant to HPV and cervical cancer listed by the women were transcribed verbatim and entered into a computer database. The questions and concerns were then reviewed, sorted, and thematically coded by three of the study investigators (Phase 2). Quotes of the questions and concerns expressed by the women that were deemed most representative of each of the sub-categories were identified, marked, and tabulated.

Protection of Human Subjects

The study was submitted for review and approval to the Institutional Review Board for the Protection of Human Subjects of the University of the Virgin Islands and the University of Wisconsin Milwaukee. Approval of the study by both Institutional Review Boards was obtained before the study was initiated.

Results

Participant Profile

A total of 458 single, unmarried women from the U.S. Virgin Islands volunteered to participate in the study. A summary of data reflective of the personal demographic characteristics of the women involved in the study is presented in Table 1. The women ranged in age from 18 to 44 years of age (mean age = 23.1 years, $SD = 5.3$). The greater majority identified their place of residence as "St. Thomas" (67.2%) and described their race/ethnicity as "Black" (78.4%).

When asked to describe their employment status, 32.1% ($n = 147$) of the women involved in the study reported that they were "working full-time," and 17.7% ($n = 81$) reported that they were "working part-time." When asked to describe their source of health insurance, 31.0% ($n = 142$) reported "no insurance," and 27.9% ($n = 128$) reported being insured by a "government health plan." Among the women reporting years of education completed, 51.3% ($n = 235$) reported having completed one to three years of college. Sixteen percent ($n = 71$) reported that they were college graduates (see Table 1).

Physical Examination, Screening, and Risk Management

A summary of data reflective of health status, physical examination, cervical cancer screening, and HPV/cervi-

Table 1. Demographic Profile of the Study Participants (N = 493)

Characteristics	N (%)
Island of residence	
St. Thomas	308 (67.2)
St. Croix	143 (31.2)
St. Johns	7 (1.5)
Age (M = 23.1; SD = 5.3 years)	
18-19	121 (26.4)
20-29	283 (61.8)
30-39	45 (9.8)
40-44	9 (2.0)
Race/Ethnicity	
Black	359 (78.4)
White	23 (5.0)
Hispanic	30 (6.6)
Asian/Pacific Islander	5 (1.1)
Native American	1 (0.2)
Other	19 (4.1)
Highest educational level (M = 14.3; SD = 1.2 years)	
< 13	25 (5.5)
13-15	235 (51.3)
16+	71 (21.5)
Not reported	127 (27.7)
Employment status	
Working full-time	147 (32.1)
Working part-time	81 (17.7)
Unemployed	52 (11.4)
Disabled	3 (0.7)
Full-time student	171 (37.3)
Health insurance status	
Individual plan self paid	58 (12.7)
Group plan, employer paid	85 (18.6)
Government health plan	128 (27.9)
Medicaid	11 (2.4)
Medicare	16 (3.5)
No insurance	142 (31.0)

Table 2. Physical Examination, Cervical Cancer Screening, HPV/Cervical Cancer Risk Management (N = 493)

Characteristics	N (%)
Physical examination	
Within the past year	280 (61.1)
Within the past 2 years	86 (18.8)
Within the past 3 years	28 (6.1)
Within the past 5 years	19 (4.1)
55 or more years	21 (4.6)
Never	18 (3.9)
Cervical cancer screening	
Within the past year	187 (40.8)
Within the past 2 years	42 (9.2)
Within the past 3 years	11 (2.4)
Within the past 5 years	3 (0.7)
55 or more years	6 (1.3)
Never	102 (22.3)
HPV vaccination	
Yes	29 (6.3)
No	227 (49.6)
Unsure	50 (10.9)
BMI	
Underweight	17 (3.7)
Normal weight	191 (41.7)
Overweight	108 (23.6)
Obese	106 (23.1)
Chronic health conditions	
Yes	31 (6.8)
No	411 (89.7)
Smoking status	
Current smoker	36 (7.9)
Former smoker	45 (9.8)
Never smoked	373 (81.4)
Perceived health status	
Excellent	120 (26.2)
Very good	205 (44.8)
Good	105 (22.9)
Fair	21 (4.6)
Poor	5 (1.1)

cal cancer risk management of the women involved in the study is presented in Table 2. Sixty-eight percent ($n = 310$) described their health status as being "very good" or "good" and 26.2% ($n = 120$) reported their health status as being "excellent."

Seven percent ($n = 31$) of the women reported chronic health concerns/conditions. Eighteen percent ($n = 81$) reported a history of smoking. Estimates provided by the

women specific to weight and height suggested that 3.7% ($n = 17$) were underweight, 23.6% ($n = 108$) were overweight, and 23.1% ($n = 106$) were obese.

Sexual behavior and chronic HPV infections are cervical cancer risk factors. When asked to describe their sexual activity, 76.8% ($n = 352$) of the women reported that they

had been sexually active during the previous six months. Among them, 62.2% ($n = 219$) reported having one sexual partner, 15.6% ($n = 55$) reported having two sexual partners, and 22.2% ($n = 78$) reported having three or more partners during the previous six months.

Women should begin annual cervical cancer screening when they become sexually active, or by the age of 20 if they are not sexually active. Forty-one percent ($n = 187$) of the women involved in the study reported that they had cervical cancer screening within the past year. Twenty-two percent ($n = 102$) of the women reported that they had never been screened for cervical cancer. Sixty-two percent ($n = 168$) of the sexually active women and 24.0% ($n = 18$) of the women who were not sexually active reported that they had cervical cancer screening within the past year. Twenty-one percent ($n = 57$) of the sexually active women and 58.7% ($n = 44$) of the women who were not sexually active reported that they had never been screened for cervical cancer within the past year (see Table 2).

Questions about HPV, Cervical Cancer, and Risk Management

When asked about participation in educational programs focused on women's health, cervical cancer prevention, or the prevention of sexually transmitted diseases, 74.2% ($n = 340$) of the women involved in the study reported participating in programs in the community or the health-care arena. However, when asked if they had specific questions about HPV and cervical cancer, the majority responded in the affirmative.

Five themes relevant to HPV, cervical cancer, HPV/cervical cancer prevention, and risk management emerged from the review of questions reported by the women involved in the study. Included among them were questions about the HPV and cervical cancer etiology; signs and symptoms of HPV infection and cervical cancer; HPV and cervical cancer screening; and, HPV and cervical cancer prevention and risk management (see Table 3).

Multiple questions that were asked by the women focused on the origin of the HPV, the varying types of HPV, HPV and cervical cancer risk factors, risk factors associated with HPV transmission, and the development of cervical cancer. Similar questions were raised about "early signs," "warning signs," symptoms associated with HPV infection and cervical cancer, and, if, when, and how often, women should be tested. However, the greatest number of questions raised by the women focused on HPV and cervical cancer prevention and risk management. Included among them were specific questions about how the HPV is transmitted; questions about the appropriate use and effectiveness of male and female barrier methods (i.e., condoms) to reduce HPV and cervical cancer risk; questions about the safety, availability, and cost of the HPV vaccine; and questions about the need for more community education and outreach (see Table 4).

Discussion and Implications

Given current science and medical practice, there should be more significant reductions in the incidence and death from cervical cancer among women in the U.S. and its territories. However, this will only become a reality if education and health-care services are available to, and used by, women who are at risk, in need, and underserved. Programs that address HPV risk, cervical cancer prevention and control, HPV vaccination, and condom use were seemingly well attended by women involved in this study. However, results from this study suggest that there is much more work that remains to be done. Experts in the community arena have alluded to the fact that culturally and linguistically appropriate educational interventions need to be developed and field-tested for use in the U.S. Virgin Islands. In addition to furthering the exploration of cervical cancer risk-management and the impact of HPV on cervical cancer morbidity and mortality in women, experts who are involved in the scientific and clinical arena have commented about the need to assess the impact of knowledge, attitudes, and behaviors of males relative to HPV and HPV-associated medical problems such as rectal, anal, head, and neck cancer. Because of its association with cervical cancer, infection with the HPV is often perceived as a women's health issue. Its conceptualization as a family/community issue is imperative if the desired reduction in morbidity and mortality is to be achieved.

Using this broader framework, the University of the Virgin Islands (UVI) and its community partners can promote multi-faceted initiatives that address the questions and concerns enumerated by the women in this study. Health promotion behaviors require informed decision making, which is predicated upon the communication and acquisition of medically accurate and culturally-appropriate information. To take responsibility for one's health by engaging in health promotion behaviors, one must be empowered through knowledge.

The Division of Nursing Education and the Caribbean Exploratory (NCMHD) Research Center for Excellence at the University of the Virgin Islands are stakeholders in the quality of life and the level of healthcare enjoyed by the residents of the territory. The University, through the Research Center, promotes collaboration of faculty, staff, students, and community partners in research on health disparities. Various strategies have been used to report research findings to the community and to respond to identified needs. Dispelling misconceptions and myths surrounding the HPV and cervical cancer, and the intentions of the health-care system regarding the HPV vaccine requires a strong, focused, and sustained education campaign along with continued positive dialogue among all stakeholders (Brewer & Fazekas, 2007; Scarinci, Garcés-Palacio, & Partridge, 2007; Liddon, Hood, Winn, & Markowitz, 2010). Using a collaborative model and an inclusive approach to interventions engendered by the findings of this study, a targeted program of education on HPV and its associated health problems can be undertaken. Targeted groups could include clinicians and policymakers, males and females from junior high schools, senior high schools, and the university, as well as parents and teachers.

Table 3. Questions about HPV and Cervical Cancer

Theme	Representative Questions
HPV etiology	<ul style="list-style-type: none"> • Where does the HPV come from? How does a person actually get it? • How many different types of HPV are there? Do all types of HPV cause cancer? Do some types of HPV cause warts? • How will I know if my partner has HPV? What do HPV lesions look like? • Why do they call cervical cancer a sexually-transmitted disease? • Can you get an HPV infection without having sex? • Can you get an HPV infection from making out with strangers? • Can the HPV be passed from person to person by kissing? Can you get it deep in your throat? • Who is more likely to get an HPV infection? • Does having more than one sexual partner increase a person's risk of HPV? Does one's risk of HPV increase with sexual activity? • Where does the infection enter your body?
Cervical cancer etiology	<ul style="list-style-type: none"> • What is the primary cause of cervical cancer? • Is cervical cancer hereditary? If you do not have a family history, what is the cause of this disease? • Who is more likely to get cervical cancer? • Does having more than one sexual partner increase my risk of cervical cancer? • What does cervical cancer look like? • Will every person who is diagnosed with HPV infection get cervical cancer? • How would I know if I had been exposed to a HPV or if I was infected by a HPV?
Signs and symptoms of HPV infection	<ul style="list-style-type: none"> • What are the signs and symptoms of an HPV infection?
Signs and symptoms of cervical cancer	<ul style="list-style-type: none"> • What signs of cervical cancer should I be looking for? Are there early warning signs? • Does cervical cancer cause pain?
HPV and cervical cancer screening	<ul style="list-style-type: none"> • How easy is it for doctors to detect cervical cancer? • Are PAP smears really adequate for detection? • Can HPV be detected before it causes cancer? • In addition to annual check-ups, what type of examination should we get?
HPV vaccine	<ul style="list-style-type: none"> • Is there a vaccine to prevent HPV? • How effective is the vaccine? • Is the vaccine safe? • Why is the vaccine so costly? • Where can I go to get the vaccine in our community? • Where can I get more information about the HPV vaccine?
HPV and cervical cancer risk management	<ul style="list-style-type: none"> • What can I do to decrease my risk of HPV infection and cervical cancer? • What can we do to prevent girls and younger women from becoming exposed? • What can older women do to reduce their risk of getting HPV and cervical cancer?

The University of the Virgin Islands can provide a venue for diverse stakeholders to come together to discuss HPV and cervical cancer and to stimulate conversations that could lead to the development and implementation of policies and strategies to reduce disparities. Other university-led initiatives ranging from one-on-one conversations to structured empowerment sessions could be employed in a variety

of settings to increase awareness of HPV and cervical cancer and other health disorders. The university-led initiatives could include forums for junior high school, high school, and college-aged males conducted by trained male peer educators; forums for females with emphasis on cervical screening, promoting, and supporting adherence to follow-up care of abnormal screening results; and understanding

Table 4. Questions about HPV and Cervical Cancer Risk Management

Theme	Representative Questions
Types of male and female barriers	<ul style="list-style-type: none"> • What are there different types of condoms? • Do condoms come in different sized? Are there condoms for men that are larger, smaller or who need extra length? • What do you do if the condom seems to be too big for your partner? • Are there condoms for women? • What do you do if you are allergic to latex? Are there latex-free condoms? • Is there a condom specially designed for use when “giving head”?
Use of male and female barriers	<ul style="list-style-type: none"> • When should condoms be used? Exactly how do you use them? • Is there a right way to put on and take off condoms? • Can condoms be used more than once? • Are there any safety tips that I should always keep in mind when using condoms? • If a person wants to be really safe, should they “strap twice”? • Do petroleum-based products really affect condom effectiveness? • Do condoms expire? If so, where do I look for the expiration date? Are expired condoms safe to use?
Effectiveness of male and female barriers	<ul style="list-style-type: none"> • How effective are male condoms? What about female condoms? Are female condoms effective? • Are certain brands of condoms more effective than others? • What can I do to prevent the condom from slipping off? • How often do condoms break? What are the most common reasons they break? • What can I do to prevent them from breaking?
Community education and outreach	<ul style="list-style-type: none"> • Why are there not more classes available to us to help us learn about these issues on college campuses and in the community? • Why is there not more education for girls about HPV, sexually-transmitted diseases and cervical cancer in elementary and high school?

issues related to HPV vaccination led by trained female peer counselors; forums for Parent Teacher Student Associations to increase knowledge; debunk myths related to HPV, cervical cancer, and the HPV vaccine; and programs that foster conversations regarding testing and vaccination of teenagers and young adults led by university faculty and staff. Engaging in these research and collaborative community efforts will provide nurses within the Virgin Islands an opportunity to advance nursing science, to improve cervical cancer prevention and cervical cancer care within the territory, and to contribute to the management of a health concern of local and global significance.

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Clinical Resources

- Cervical Cancer Facts - American Cancer Society (www.cancer.org/)
- HPV, Cervical Cancer and Condom Use – Facts (<http://www.cdc.gov/>)
- Using Condoms, Condom Types and Condom Sizes (www.avert.org/usecond.htm/)
- No Condom No Way (www.nocondomnoway.com)

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