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HPV knowledge and attitude among homeless women of New York City shelters

Ramin Asgary, MD, MPH^{a,b}, Analena Alcabes, BS^b, Rebecca Feldman, MD^C, Victoris Garland, BS^b, Ramesh Naderi, MD^a, Gbenga Ogedegbe, MD, MPH^a, and Blanca Sckell, MD, MPH^b

Ramin Asgary: ramin.asgary@caa.columbia.edu; Analena Alcabes: Analena.alcabes@gmail.com; Rebecca Feldman: feldmara@gmail.com; Victoris Garland: vfg6@cornell.edu; Ramesh Naderi: rameshnaderi1@gmail.com; Gbenga Ogedegbe: olugbenga.Ogedegbe@nyumc.org; Blanca Sckell: bsckell@gmail.com

^{a,b}Assistant Professor, Departments of Population Health and Medicine, New York University School of Medicine, 227 E30th Street, Room 639, New York, NY 10016, U.S.A.

^bLutheran Family Health Centers, Department of Community Medicine, 317 Bowery Street, New York, NY 10003, U.S.A

^CThe Hospital of the University of Pennsylvania, Department of OBGYN, 3400 Spruce St, Philadelphia, PA 19104

^bLutheran Family Health Centers, Department of Community Medicine, 317 Bowery Street, New York, NY 10003, U.S.A

^aNew York University School of Medicine, 227 E30th Street, New York, NY 10016, U.S.A.

^aNew York University School of Medicine, 227 E30th Street, New York, NY 10016, U.S.A.

^bLutheran Family Health Centers, Department of Community Medicine, 317 Bowery Street, New York, NY 10003, U.S.A

Abstract

Background—Human papillomavirus (HPV) has not been studied among homeless women in the United States. We assessed knowledge and attitudes regarding HPV infection and the HPV vaccine among homeless women.

Methods—We enrolled 300 homeless women age 19 to 65 residing in multiple New York City shelters from 2012 to 2014. We used a national survey to collect HPV data.

Results—Mean age was 44.7 (± 12.16) years. The majority were Black, heterosexual, and single; 50.6% were smokers. Almost all HPV knowledge and attitudes data were considerably below the national averages; 41.9% never heard of HPV. Only 36.5% knew that HPV is a sexually transmitted diseases; 41.5% knew that HPV causes cervical cancer; and only 19.5% and 17.3%

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received provider counseling regarding HPV testing and vaccine, respectively. Among participants, 65.4% reported that they would vaccinate their eligible daughters for HPV. Lower rate of up-to-date Pap test was associated with lack of knowledge regarding relationship between HPV and abnormal Pap test ($p<0.01$).

Conclusions—We recommend improved HPV counseling by providers during any clinical encounter to reduce missed opportunities, coupled with employing patient teaching coach or navigators to improve health literacy and to connect patients to services regarding HPV and cervical cancer.

Keywords

HPV; homeless; health disparities

Introduction

Human Papillomavirus (HPV) is the most common sexually transmitted infection (STI) in the US (Dunne et al., 2007). Two of the high-risk strains of HPV, 16 and 18, account for over 70% of all cases of cervical cancers. HPV can also cause other cancers including vulvar, anal, and head and neck cancers (World Health Organization (WHO), 2014). Cervical cancer is the second leading cause of cancer deaths in women worldwide. In the United States, it cost \$1.6 billion to treat cervical cancer in 2010 (National Cancer Institute, 2014). Pap and HPV testing and HPV vaccines are available in the US. Disparities exist, however, in the ability to access these preventive services especially among the homeless population who has been overlooked in preventive care and HPV research. Around 3.5 million Americans are homeless annually; 630,000 each night (National Alliance to End Homelessness, 2013; National Coalition for the Homeless, 2013; US Department of Housing and Urban Development, 2011). New York City (NYC) has one of the highest levels of homelessness with around 28,000 adults sleeping in the municipal shelter system each night (Markee, 2013; Metrauz, 2012). Homeless are more likely to suffer from mental illness, have limited primary care opportunities (Kushel, 2013; Khandor et al., 2011), and usually experience stigma and discrimination in the health care systems (Khandor et al., 2011; Wen, Hudak, and Hwang, 2007). History of substance abuse and alcohol, earlier sexual activities, prior sexual abuse history, and poor family and social support may put them at increased risks for STIs (Rotheram-Borus et al, 1996).

In the general population misinformation exists regarding the relationship between HPV and cervical cancer and symptoms associated with genital warts (Mays et al, 2000; Denny-Smith, Bairan, and Page, 2006), however there is currently no published data on knowledge, attitudes, and practices related to HPV and its vaccine in the homeless. Nationally, more than 78% of women had proper knowledge regarding the association of an abnormal Pap test and HPV infection, nearly two-thirds knew about the HPV vaccine, and more than half knew that HPV is a sexually transmitted disease (National Institute of Health, 2013). Accurate information about HPV infection and vaccines, and availability and access to HPV testing and vaccination are all likely to improve preventive care behavior (Kahn et al., 2003). We assessed knowledge and attitudes in regards to HPV infection and the HPV vaccine among homeless women in NYC's shelters.

Materials and Methods

Setting and Design

The Community Medicine Program of Lutheran Family Health Centers serves homeless populations at multiple shelters in New York City. We performed a prospective cross-sectional study enrolling homeless women (19 to 65 years old) from 6 shelters and shelter-based clinics between 2012–2014. We excluded women who are non-English/Spanish speaking, unable to consent or answer questions, and had hysterectomy with removal of cervix. Random weekdays were selected to enroll participants in the community room of the shelters or waiting rooms of the shelter-based clinics. Research assistants evaluated eligibilities, described the study, obtained consent and administered the survey face-to-face in a private room. An interpreter was used when needed. The study was described as “a study to evaluate knowledge, attitude and practice regarding HPV infection and HPV vaccination among homeless women residing in New York City shelters.” We informed participants that participation in the study would not affect their services at shelters in any way and that they could retract their responses at any time during and after participation. A \$5 dollar Metrocard was provided as compensation to each participant.

The survey contained questions pertaining to knowledge, attitude, and self-efficacy regarding HPV infection and vaccine using an adapted validated survey from the National Cancer Institute, Health Information National Trends Survey (HINTS) (National Institute of Health, 2013). HPV vaccine related data was collected because it was relevant to participants’ age group of 19 to 26 years and because of its potential relevance to knowledge transfer to participants’ female offspring. Data on socio-demographics, length of homelessness, smoking history was also collected. All data were self-reported. History of Pap testing was collected and considered up-to-date if it was performed within the past three years of the survey date (Sabatino et al, 2012). The survey took approximately 30 minutes to complete. We did not collect any biological samples. Participants received a unique identification codes and we informed participants that no one outside of the research team had access to any study data. Participants who were eligible for Pap testing or HPV vaccine were referred to shelter-clinics. This study received the Institutional Review Board approval from the Lutheran Family Health Centers.

Outcomes and Analyses

Primary outcomes were rates of knowledge and attitudes related to HPV infection and vaccine. Secondary outcomes were rates of Pap smear. Others indicators included age, race, education, smoking history, marital status, and sexual orientation. All variables were dichotomous/categorical (questions evaluating current knowledge, attitude and practices in regard to HPV infection and vaccine and the latest Pap test). Descriptive statistics, univariate and bivariate analysis using *chi* square and *t* test were performed where indicated. We calculated rates for outcomes and presented results in frequencies and percentages. SPSS Version 20.0 was used for data analysis. This study was performed as a sub-study of a larger project evaluating cervical cancer screening rates and predictors among homeless women. The sample size for that study was calculated based on the rates of Pap test among ethnic and racial minorities, and data from a preceding pilot study with 88 participants (not

published elsewhere). We hypothesized that the rate of Pap test among homeless women in New York City is at least 75% (Centers for Disease Control, 2010; Lebrun-Harris, 2013) and calculated a sample size of 288 (two-sided $\alpha=0.05$, power=0.8, and 0.05 precision around mean).

Results

Demographics

The average age of 300 participants was 44.47 years (± 12.16 years). Among participants, 50.1% were Black; 86.4% heterosexual; and 50.6% current smokers. More than 30% were current contraception users including 24% condom users. Among participants 41.3% were homeless for more than 1 year. There was no association between duration of homelessness and age, race/ethnicity, and current smoking. Married or divorced women were more likely to be homeless for more than a year (Chi-square, OR: 1.17; $p < 0.03$), and having a high school education or less was associated with longer duration of homelessness (Chi-square, OR: 1.2; $p < 0.02$). There were a number of indicators with missing data regarding cigarette smoking including the number of cigarettes smoked per day and duration of smoking, which were largely due to lack of reporting by participants. These indicators were not included in bivariate or logistic regression analysis. Socio-demographics are presented in Table 1.

Study Outcomes

HPV and HPV Vaccine—Nearly 42% had never heard of HPV. While 58.2% had heard of the virus, only around 42% knew of the relationship between HPV and abnormal Pap or cervical cancer. Knowledge of this relationship was not associated with the duration of homelessness. Only 25% heard about HPV from a health provider; only 19.5% had received information regarding HPV testing or its vaccine (17.3%) from a health care provider; and only 36.6% knew HPV is a sexually transmitted disease. Overall, 76.4% of women reported they were up to date with the United States Preventive Services Task Force recommendations for Pap test. There were no association between duration of homelessness and being up-to-date for Pap test, or counseling regarding HPV test by a health provider. Not being in compliance with recommended Pap testing was associated with lack of knowledge regarding the relationship between HPV and abnormal Pap test (Chi-square, OR: 1.33; $p < 0.01$). Table 2 presents data in regards to HPV and Pap testing and provides corresponding data and rates from the national surveys for comparison.

In multiple logistic regression when race, age, sexual orientation, marital status, level of education, duration of homelessness and cigarette smoking were in the model, none had any significant association with knowledge about HPV and its vaccine.

Discussion

A significant portion of our homeless women had never heard of HPV or its vaccine. The overall knowledge levels regarding HPV and its vaccine were remarkably lower among homeless women compared to the national averages; in particular the knowledge of a relationship between HPV and abnormal Pap test or cervical cancer (national level rates of 78% and 61.2%, respectively) (National Institute of Health; 2013). A very small number of

homeless women in our sample had ever been tested for HPV, and there were misconceptions regarding HPV vaccine and the nature and consequences of HPV other than cervical cancer. Provider counseling regarding HPV, HPV testing and HPV vaccine was much lower than the national averages. We hypothesize that these knowledge gaps were due to inadequate health education and counseling during hospital visits or clinical encounters where often the emphasis is on addressing the urgent medical care and neglecting preventive care and health education.

Targeted health education are especially important for the homeless women as they are at higher risk of HPV infection and cervical dysplasia, due to risk factors such as smoking, early sexual activities or multiple partners, and unprotected sex (Rotheram-Borus, 1996; Zlotnick and Zerger, 2008). The homeless are less likely to receive health education and preventive care after leaving shelters as the homelessness is often a recurrent or chronic problem. The majority of the homeless have ongoing and complicating social conditions and lack social support with infrequent access to primary care (Metraux, 2012; National Alliance to End Homelessness, 2013; National Coalition for the Homeless, 2013). Low health literacy in regards to HPV may also be due to the fact that the homeless face multiple competing social conditions, and are often uninsured, which interferes with continuity care and health education opportunities during clinical encounters. Furthermore, an instrumental part of a successful cervical cancer screening and control program is effective health education regarding the risk factors and preventive strategies including HPV knowledge and HPV testing and vaccine, which are often overlooked in the homeless.

The homeless also face significant stigma and discrimination in health care settings, and that may discourage them from openly discussing their concerns regarding their sexuality and reproductive care, asking health questions, and seeking appropriate care (Wen, Hudak, and Hwang, 2007). Health system discrimination and providers' implicit biases against the minorities, low-income populations, and the homeless and their medical priorities have been documented (Wen, Hudak, and Hwang, 2007; Devine, 2012; Cooper et al., 2012; Hausmann et al., 2011). Furthermore, providers often lack training and skills to deal with the social conditions of the homeless that influence their health care. All these factors will negatively influence the homeless' desire to seek out healthcare and have further impact on their health literacy and preventive care (Wen, Hudak, and Hwang, 2007).

Providers' education and preparation to address biases and stigma along with cultural competency and communication skills building (Devine, 2012; Peek et al., 2012; Teal, et al., 2010), with emphasis on offering health counseling to all patients irrespective of their social conditions, may help minimize missed opportunities to provide HPV health education to the homeless. Electronic medical record reminders could also help improve targeted health education regarding STIs and HPV for high-risk populations including the homeless and with discussions on cancer control and screening during clinical encounters that may otherwise be overlooked (Loo et al., 2011). The homeless in our sample showed more enthusiasm towards following new recommendations to vaccinate their daughters for HPV compared to the national average likely because they value and welcome any potential health services to improve their overall health.

There is no published data evaluating knowledge and attitudes regarding HPV infection and the vaccine among homeless women, which is remarkable considering the large number of millions of homeless Americans. National level data does not provide specific information regarding the socio-economically disadvantaged population of homeless women (NIH, 2013). The homeless are less likely to be accessible, and therefore are under-represented in the national surveys, due to their mobility and lack of permanent address or landline phones. Better assessment and evaluation of preventive approaches to cervical cancer including knowledge and attitudes regarding risk factors and available services for the homeless and health education strategies in the shelter-based or federally funded clinics where the homeless seek care is needed.

There are opportunities to address these gaps during the homelessness where the homeless, in general, stay in the shelter system for a long time and where peer or patient educators could serve as vehicle to offer more targeted health education. Case managers/workers programs that help with social service referrals could be expanded and utilized to improve health literacy and cancer screening referrals. Patient navigator strategies have shown improvement in cancer screening among racial and ethnic minorities (Glick, 2012; Sabatino, 2012), and could be adapted to provide tailored education and address individuals' misconception, as well as provide help with vaccinations and reminders. These potential strategies are consistent with the Affordable Health Act (Title IV) to improve access to preventive care services for adults in Medicaid.

We performed a prospective study investigating HPV determinants, as a major risk factor for cervical cancer, with direct input from the homeless, which has never been done before. We collected comprehensive data using a validated national survey, which made it possible to compare our data with that of the national level. We enrolled homeless women who resided in the shelters and/or on streets, and were able to obtain a good sample size from multiple shelters in NYC, a city with one of largest populations of the homeless in the US, which makes our data more generalizable. However, our study has limitations. We assessed only English/ Spanish speaking persons. However this reflects 90% of our patient population in the NYC shelters or shelter clinics. Self-reported health data on HPV and especially cervical cancer may be prone to biases including recall bias and over-reporting, especially among socio-economically disadvantaged persons (Lofters et al 2013). We did not directly provide HPV testing, and did not collect history of substance abuse or mental health problems, which could have been relevant to our findings. A significant percentage of the homeless women in our study had never heard of HPV or its vaccine; the majority were Black with low levels of education, and half were smokers. *Additionally, this study was a primarily descriptive study.* All these factors may have contributed to the lack of association between some socio-demographics or other indicators with the knowledge of HPV and its vaccine.

Implications for practice and/or policy

Strategies to improve HPV knowledge, attitude and practice and to strengthen cervical cancer prevention and control initiatives need to be implemented in settings where the homeless seek care. We recommend improved provider counseling and health education at

all clinical encounters, employing patient or peer educators, and providing targeted reading materials in the shelters to address misconceptions and improve HPV related health literacy that are tailored to the demographics, health beliefs and social supports of the homeless.

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Biographies

Ramin Asgary is a health services researcher and educator with substantial experience in health disparities solutions in both domestic and global health context. His area of expertise is access to healthcare for vulnerable populations of the homeless, immigrants and refugees.

Analena Alcabes is a medical student with interest in the healthcare of the poor and underserved. She has working experience with the homeless addressing their access to healthcare and women's health issues.

Rebecca Feldman is a resident physician with interests in women's health issues among the underserved populations.

Victoria Garland is a medical student with interest in healthcare of the poor and underserved. She has working experience with the homeless addressing their women's health issues.

Ramesh Naderi is a physician researcher with interest and experience in global health issues and health disparities research.

Gbenga Ogedegbe is a clinician researcher with extensive experience in health disparities research, health services research, and minorities health.

Blanca Sckell is a clinical educator with interest and experience in healthcare of the poor and underserved including the homeless.

Table 1

Socio-demographics of homeless women from New York City shelters, 2013–2014

Indicators n=300	N (%)
Age (years)	Mean 44.47 ($\pm$ 12.16) R:21–65
Years of homelessness (n=298)	
• 1 yr	175 (58.7)
• >1 but 3yrs	63 (21.1)
• > 3yrs but 5 yrs	25 (8.3)
• > 5 yrs	34 (11.4)
Marital status (n=299)	
• Single	192 (64.2)
• Married	30 (10)
• Divorced, separated, widowed	77 (25.7)
Level of education (n=297)	
• High School	186 (62.6)
• Some college or college	111 (37.4)
Race categories (n=297)	
• White	46 (15.4)
• Black	149 (50.1)
• Hispanic	67 (22.5)
• Asian, native American, others	35 (11.7)
Language	
Exclusively Spanish speaking	10 (3.3)
Sexual orientation (n=287)	
• Heterosexual	248 (86.4)
• Homosexual	18 (6.2)
• Bisexual	21 (7.3)
Current cigarette smoker (n=219)	111 (50.6)
Number of cigarette per day (n=51)	6.13 ($\pm$ 4.07) R:1–20
Years of cigarette smoking (n=52)	21.54($\pm$ 13.25) R: 0–50
Past cigarette smoking (n=55)	17 (30.9)
Current contraception use (Inclusive answers) (n=300)	93 (31)
• Condom	• 72 (24)
• Oral Contraception	• 17 (5.7)
• Sterilization	• 8 (2.6)
• IUD	• 10(3.3)

Indicators n=300	N (%)
• Abstinence	• 53 (17.7)
• Other	• 5 (1.7)

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Table 2

HPV knowledge and attitude and Pap smear among homeless women of New York City's shelters, 2013–2014, and the corresponding national rates (National Institute of Health, 2013)

Indicators n=297	N (%),	National (%) *
Does HPV cause cancer (n=299)		
• Yes	124 (41.5)	[61.2]
• Don't know or no	50 (16.8)	[37.2]
• Never heard of HPV	127 (41.8)	
Does HPV cause abnormal Pap (n=299)		
• Yes	125 (41.8)	[78]
• Don't know or no	49 (16.4)	[3.6]
• Never heard of HPV	125 (41.8)	[18]
Have been ever treated for Genital Wart (n=299)	17 (5.7)	[4]
Been told has HPV infection (n= 299)		
• Yes	16 (5.4)	[8.2]
• No or don't know	158 (52.8)	[91.9]
• Never heard of HPV	125 (41.8)	
Is HPV contracted via sexual (n=298)		
• Yes	109 (36.6)	[54.8]
• No	64 (21.5)	[20.2]
• Never heard of HPV	125 (41.9)	
Is HPV rare? (n=299)		
• Yes	40 (13.3)	[12]
• No	94 (31.4)	[69.6]
• Never heard HPV or don't know	165 (55.1)	[18.3]
Is HPV self-limiting? (n=298)		
• Yes	17 (5.7)	[4.8]
• No	123 (41.3)	[63.0]
• Never heard of HPV/don't know	158 (53)	
Does HPV affect fertility? (n=299)		
• Yes	109 (36.5)	[57.6]
• No	16 (5.4)	[13.4]
• Never heard of HPV/don't know	174 (58.2)	[28.9]
How Did you hear of HPV? (n=296)		
• School	17 (5.7),	[15.7]
• Reading materials	26 (8.8)	
• Doctors or health providers	74 (25)	
• Other women/peers	13 (4.4)	

Indicators n=297	N (%),	National (%) *
• TV	42 (14.2)	
• Never heard HPV/don't know	124 (41.9)	
Heard of HPV vaccine? (n=299)		
• Yes	126 (42.1)	[66.6]
• No	86 (28.8)	[31.2]
• Never heard HPV/don't know	87 (29.1)	[2.2]
Provider talked of HPV vaccine? (n=286)		
• Yes	50 (17.3)	[20.6]
• No	95 (32.9)	[76.8]
• Never heard HPV/don't know	144 (49.9)	
Provider talked HPV tests? (n=298)		
• Yes	58 (19.5)	[14.6]
• No	115 (38.6)	[84]
• Never heard HPV/don't know	125 (42)	[1.2]
If HPV vaccine, will you continue Pap? n=295		
• Yes	158 (53)	[94.4]
• No	3 (1)	[0.8]
• Never heard of HPV/don't know	137 (46)	[4.8]
Will vaccinate eligible daughter ? (n=298)		
• Yes	195 (65.4)	[56.1]
• No	39 (13.1)	[15.5]
• Don't know	64 (21.5)	[28.6]
Last Pap test (n=292)		
• 3 yrs	223 (76.4)	
• >3 yrs	53 (18.2)	
• Never had Pap	16 (5.5)	

* National Rates do not add up due to slightly different question formats over years.