Measuring Knowledge of Cancer Screening and Prevention Strategies in HIV Healthcare Professionals

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Objective: Due to advances in the care of people living with HIV/AIDS (PLWHA), life expectancy significantly increased, putting this group vulnerable to age-related comorbidities, such as cancer. The objective of this study was to describe the knowledge of cancer screening (cervical, breast, anal, colon, prostate) and other cancer prevention strategies (HPV vaccination, HPV testing) among HIV care professionals in Puerto Rico (PR).

Methods: Cross-sectional study using a sample of 104 HIV healthcare professionals in PR. Descriptive analyses were used to characterize the study sample. Logistic regression analysis was used to determine the relation of sociodemographic and work-related factors with cancer screening knowledge.

Results: On average, the healthcare professionals interviewed had been working for more than 10 years with the HIV/AIDS population (11.5±7.6 years). Multivariate analysis showed that physicians had a higher likelihood of having extensive knowledge of cervical (OR=3.96; 95% CI=1.23, 12.77) and anal cancer (OR=9.4; 95% CI=2.2, 41.0) screening than other healthcare professionals. For anal cancer in particular, as the number of years a given participant had been working with people living with HIV/AIDS increased, the likelihood that this participant would have extensive knowledge of anal cancer screening significantly increased (10% year).

Conclusion: Health education interventions, tailored to healthcare professionals who recently finished their formal education should be developed in HPV-related cancers. Such training would improve cancer prevention and control efforts, thereby benefitting the HIV population in Puerto Rico. [PR Health Sci J 2016;35:147-153]

Key words: HIV/AIDS, Quantitative Methods, Workforce Development, Cancer Prevention & Screening, Community Health

Human papillomavirus (HPV) is one of the most commonly diagnosed sexually transmitted infections worldwide (1). HPV has been associated with cancer of the cervix, anus, vulva, vagina, penis, oral cavity, and oropharynx, accounting for 5.2% of all cancers worldwide (2). For people living with HIV/AIDS (PLWHA), a higher risk of HPV infection and HPV-related cancers are observed as compared to the general population (2, 3, 4, 5, 6, 7, 8).

According to a report from the Centers for Disease Control and Prevention, in 2013, Puerto Rico (PR) was one of the 10 states and territories that had the highest cumulative number of AIDS cases, HIV incidence, and prevalence of infection (9). As of July 2014, the PR HIV/AIDS Surveillance System reported that there were 46,152 cases of HIV infection in PR and 19,883 persons living with HIV (10). In addition, disproportionately higher burden of HIV, as well as of certain infection-related and non-infection related cancers have been observed among minority populations in PR and the US (4, 11, 12, 13).

Since delayed screening practices will have an impact on early detection, and given the high burden of HPV-related cancers on PLWHA in PR (4), it is important to understand the knowledge related to cancer screening practices among healthcare professionals who provide direct services to this population. Therefore, the objective of this study was to create a general profile of these individuals and determine the correlates

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associated with their levels of knowledge of cancer screening tests and other cancer prevention strategies.

Study methodology
This cross-sectional study recruited 104 HIV healthcare professionals in PR. Participants were recruited through invitation letters and a brochure given at scientific meetings that gathered healthcare professionals who provide direct services to PLWHA in PR. Those healthcare professionals interested in forming part of the study, were asked to provide their contact information. Potential participants were contacted by phone or email in order to determine their availability to participate in the study interview. Since these healthcare professionals had very busy schedules but were interested in participating on the study, we provided them with various alternatives in terms of setting up the interview survey. The most common method of data collection was a personal face-to-face interview, in which trained interviewers visited the workplace of interested participants and interviewed them; the second was a telephone interview, in which the interviewers called the healthcare professionals outside of work hours and administered the survey.

The administration of the survey took approximately 15 minutes. This survey included sociodemographic characteristics, work-related factors (profession, years working as a healthcare professional, years working with HIV+), and type of workplace (public hospital, private clinic, immunology clinic, and the academia). A profile of the population to which the participant attended and the types of services provided (e.g. psychological services and case management) were also gathered. The survey also include questions related to the screening services to which they referred their HIV patients as well as their perception of their knowledge of selected cancer prevention services (cervical, anal, colorectal, prostate, breast, HPV infection, and vaccine).

At the end of the study, the participants received a thank-you note (sent by email) and an invitation to participate in an educational forum. Those who attended the forum, received information about the burden of HPV-related cancers in PR and learned about the preliminary results of some focus-group interviews that were done to evaluate the levels of knowledge about HPV-related cancer possessed by PLWHA; in addition, the results of the study in which they had participated were shared at the forum (14). The forum was held at the University of Puerto Rico (UPR) Comprehensive Cancer Center. The study described herein was approved by the UPR Medical Sciences Campus Institutional Review Board (IRB).

Knowledge of cancer screening
The participating healthcare professionals' self-perceived knowledge of cervical, breast, anal, oral, colon, and prostate cancer, as well as of the HPV test and of the HPV vaccine, was assessed. The following is a sample of the questions used: “How do you perceive your clinical knowledge in the following areas: a) cervical cancer screening, b) breast, c) colorectal, d) anal and e) prostate cancer screening? Possible responses to all these questions were a) extensive, b) adequate, and c) poor. An answer of adequate or poor was given a score of 0 (zero). If the study participant answered that he or she possessed extensive knowledge, a score of 1 (one) was assigned.

Statistical analysis
Frequency distributions and descriptive statistics were used to characterize the study sample. Univariate logistic regression was used to determine the correlation of sociodemographic and work-related factors with extensive cancer screening knowledge. Seven separate logistic regression models were analyzed using the self-perceived levels of extensive knowledge of cervical, breast, anal, colon, and prostate screening as the outcomes of interest. Furthermore, two additional models were constructed to evaluate the correlates of the self-perceived levels of knowledge of the HPV test and of the HPV vaccine.

Univariate logistic regression models and adjusted logistic regression models for years working with HIV+ were then performed to identify factors within this group that were independently associated with having an adequate knowledge of cancer screening tests and other cancer prevention practices. All statistical analyses were performed using the statistical package SAS (Version 9.1; Cary, NC).

Results
The mean age of the healthcare professionals interviewed was 44.3 ± 11.3 years; more than two thirds of them were females (70.2%). Most of the professionals were either physicians (26.9%) or nurses (25.0%). The other professionals interviewed were case workers (13.5%), health educators (6.7%), or social workers (3.9%). On average, the healthcare professionals interviewed had been working at their chosen professions for more than 15 years (15.2 ± 9.2 years). Their mean time working specifically with PLWHA was 11.5 ± 7.6 years (data not shown).

The most common clinical services offered in their clinics or organizations were part of the usual medical care for HIV/AIDS or related comorbidities, such as case management (90.4%), psychological services (85.6%), and nutritional interventions (62.5%). Regarding cancer screening and prevention practices for cancer control, the most common service offered was HPV testing (57.7%). Furthermore, the clinical services that these healthcare professionals recommended most commonly to PLWHA were colorectal (67.7%) and breast cancer screening (64.7%), followed by oral health services (60.7%) (Table 1). Of the healthcare professionals interviewed, 48.9% were unaware of the existence of any resources/programs in their regions that provided cancer prevention and control services for PLWHA. All of them (100%) expressed their interest in further training in the area of cancer screening.
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Factors associated with extensive knowledge of cervical cancer screening

Table 3 shows the association of demographic and profession-related factors with extensive knowledge of cervical cancer screening. Univariate logistic regression models showed that physicians were up to 4 times more likely to report having extensive knowledge of cervical cancer screening compared to other healthcare professionals (OR = 4.07; 95% CI = 1.29, 12.88). Meanwhile, the multivariate logistic regression model showed that, physicians were more likely than nurses and other healthcare professionals to report adequate levels
Factors associated with extensive knowledge of anal cancer screening

Univariate logistic regression models showed that female healthcare professionals were, compared to their male counterparts, 70% less likely to report having extensive knowledge of anal cancer screening (OR = 0.30; 95% CI = 0.10, 0.88). Moreover, physicians were up to 10 times more likely to report having extensive knowledge of anal cancer screening, compared to other healthcare professionals (OR = 10.14; 95% CI = 2.52, 40.78) (Table 3). Univariate analysis also showed that the length of time that healthcare professionals reported they had been working with the HIV+ was significantly associated with possessing extensive knowledge of anal cancer screening. That is, as the number of years working with PLWHA increased, the likelihood of such professionals having extensive knowledge of anal cancer screening increased, as well (by 10%) (OR = 1.10; 95% CI = 1.02, 1.19). Multivariate analysis showed that physicians had a higher likelihood of reporting having extensive knowledge about anal cancer screening, compared to nurses and other healthcare professionals (OR = 9.44; 95% CI = 2.17, 41.03), after adjusting for sex and years working with HIV+ (Table 4). Furthermore, a statistically significant association between the number of years working with HIV+ and having extensive knowledge of anal cancer remained, upon multivariate analysis.

Factors associated with extensive knowledge of colon cancer screening

A marginal association between the number of years working with PLWHA and a healthcare professionals’ extensive knowledge of colon cancer screening was observed in univariate logistic regression models. As the number of years that these individuals had worked with PLWHA increased, the likelihood that they would have extensive knowledge of colon cancer screening also increased (by 8%) (OR = 1.08; 95% CI = 1.01, 1.17). No other factors were associated with this outcome in the multivariate analysis.

Factors associated with extensive knowledge of the HPV test and the HPV vaccine

Univariate logistic regression models showed that physicians were up to 5 times more likely to report having extensive knowledge of the HPV vaccine, compared to other healthcare professionals (Table 3).

<table>
<thead>
<tr>
<th>Sex</th>
<th>Cancer screening</th>
<th>HPV-related services</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Cervical (95% CI)</td>
<td>Anal (95% CI)</td>
</tr>
<tr>
<td>Women</td>
<td>0.68 (0.25, 1.84)</td>
<td>0.64 (0.26, 1.58)</td>
</tr>
<tr>
<td>Men</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Profession</td>
<td>Nurse</td>
<td>2.20  (0.63, 7.67)</td>
</tr>
<tr>
<td></td>
<td>Physician</td>
<td>4.07  (1.29, 12.88)</td>
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<td></td>
<td>Other*</td>
<td>1.00</td>
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Table 3. Univariate logistic regression models of factors associated with extensive knowledge of cancer screening and of HPV-related services among HIV healthcare professionals in Puerto Rico.

Table 4. Multivariate logistic regression models of factors associated with adequate knowledge of cancer screening and of HPV-related services among HIV healthcare professionals in Puerto Rico.

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<td>1.00</td>
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<tr>
<td>Profession</td>
<td>Nurse</td>
<td>2.30  (0.65, 8.15)</td>
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<tr>
<td></td>
<td>Physician</td>
<td>3.96  (1.23, 12.77)</td>
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<td></td>
<td>Other*</td>
<td>1.00</td>
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**Other healthcare professionals include occupational therapists, HIV-prevention counselors, program directors, epidemiologists, clinical psychologists, pharmacists, pharmaceutical technicians, health educators, and nutritionists.**

* Other healthcare professionals include occupational therapists, HIV-prevention counselors, program directors, epidemiologists, clinical psychologists, pharmacists, pharmaceutical technicians, health educators, and nutritionists.
of the healthcare professionals indicated that their knowledge of cervical cancer is adequate or poor, which accentuates the need for capacity-building opportunities to train HIV healthcare professionals in the various aspects of cervical cancer.

For anal and colon cancer screening knowledge, individuals with more years of education and those who were physicians continued to have extensive knowledge, according to multivariate analysis. For anal cancer in particular, incidence rates have increased 26.7% in Puerto Rican men, although continue to be higher in women as compared to men (22). An excess risk of anal cancer has also been documented for men and women living with AIDS in PR, as compared to the general population. Thus, these prior documented estimates show that increased training regarding the pathogenesis of anal cancer is necessary for healthcare professionals in PR. Healthcare professionals during their early training years will, in particular, benefit from understanding the role of anal cancer in terms of morbidity and mortality in PLWHA. These trainings should focus not only on physicians but also on the other healthcare professionals who have direct involvement with HIV/AIDS patients, in which professionals our study found there to be a lower likelihood of extensive knowledge, compared with physicians. This is particularly important in a condition such as HIV/AIDS, for which a comprehensive, multidisciplinary healthcare approach is imperative if patients are to attain good clinical outcomes.

Among the study’s limitations is the fact that the results cannot be generalizable to the entire population of healthcare professionals working with HIV+ individuals in PR. Another is that information on the frequency on how often they refer these services to PLWHA was not assessed. Moreover, not having identified whether or not a given healthcare professional worked in a clinical setting that received Ryan White funding, also constitutes a limitation to our study and might impact the results. The Ryan White program provides intensive comprehensive surveillance (as per the HIV/AIDS Bureau performance indicators), which provides a diversity of preventive services, including annual cervical cancer screening (23). Healthcare professionals that work within Ryan White funded programs have constant access to these services and hence, one of the reasons that the perceived knowledge in this area is so high. Moreover, and of major importance, is that the information collected is based on self-reported perceived knowledge, which may not be correlated with true knowledge or performance measures. The results of the study could also reflect the level of comfort of these providers with the specific topics in the present survey. Since HIV counseling and risk reduction are part of their main responsibilities, it is expected that these areas represent increased levels of comfort, knowledge, or both. Future studies need to use knowledge scales in these areas and measure specific criteria related to the guidelines for cancer screening and prevention established by the United States Preventive Services Task Force (24) as well as the screening guidelines of the American Cancer Society (25) and other professional organizations. In addition, such studies need to take into account
Knowledge of Cancer Screening and Prevention

Resumen

Objetivo: La expectativa de vida en personas viviendo con VIH/SIDA (PLWHA) ha incrementado debido a los avances en los cuidados ofrecidos; convirtiéndolos en un grupo vulnerable a comorbilidades asociadas a la edad como el cáncer. El objetivo de este estudio es describir el conocimiento sobre pruebas de cernimiento de cáncer (cervical, mama, anal, colon, próstata) y estrategias de prevención (vacunación y prueba para VPH) en diversos profesionales de VIH en Puerto Rico (PR). Métodos: Estudio transversal con una muestra de 104 profesionales de la salud en PR. Análisis de regresión logística fue utilizado para determinar la correlación entre las características sociodemográficas y factores laborales con el conocimiento sobre cernimiento de cáncer. Resultados: Los participantes habían trabajado con la población VIH/SIDA por un promedio de más de 10 años (11.5±7.6 años). Análisis multivariado demostró que en comparación con otros profesionales de la salud, los médicos tienen mayor posibilidad de tener conocimiento extenso sobre el cernimiento de cáncer cervical (OR=3.96; 95% CI=1.23, 12.77) y anal (OR=9.4; 95% CI=2.2, 41.0). La posibilidad de que el participante tuviese conocimiento extenso sobre cáncer anal aumentaba significativamente a medida que aumentaban los años trabajando con PLWHA (10% anual). Conclusión: Dado al interés reportado, intervenciones educativas sobre temas relacionados al cáncer, en especial los relacionados con el Virus del Papiloma Humano, deben ser dirigidos a quienes han terminado su educación formal recientemente. El proveer estos entrenamientos podrían contribuir a los esfuerzos de prevención y control del cáncer y a su vez beneficiar a los PLWHA en PR.

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