

The Puerto Rico Community Cancer Control Outreach Program: Developing Capacity-Building Activities on Cancer Screening Guidelines and HPV Vaccination Recommendations for Health Care Professionals

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Objective: This study evaluated physicians' knowledge of cancer screening guidelines and human papillomavirus (HPV) recommendations.

Methods: The Puerto Rico Community Cancer Control Outreach Program in collaboration with the Comprehensive Cancer Control Program and the Breast and Cervical Cancer Early Detection Program developed an educational activity for physicians who attended a professional annual meeting. This activity consisted of 2 sessions: one about cancer screening guidelines and the other about HPV and HPV vaccination. A survey measuring the attendees' knowledge of the session topics was administered before and after each session. Changes in knowledge were assessed using McNemar's test with a significance level of 0.05.

Results: A total of 43 physicians responded to the survey about cancer screening, and 67 responded to the survey about HPV. A significant increase in the mean score of the pre-test (3.3 ± 1.42) and post-test (6.7 ± 1.38) of the cancer screening guidelines was observed as well as in that of the pre-test (7.82 ± 1.44) and post-test (9.66 ± 0.53) of HPV. The results showed that there were improvements regarding the most recent cervical cancer screening and colonoscopy guidelines as well as in the knowledge of HPV serotypes.

Conclusion: This mid-day educational activity significantly improved knowledge among primary care physicians. Given its feasibility, future efforts should discuss the most recent cancer guidelines and emerging socio-behavioral factors that impact vaccination. [*PR Health Sci J* 2022;41(4):217-221]

Key words: Capacity building, Community outreach, Cancer screening guidelines, HPV, Puerto Rico

Cancer is the leading cause of death in Puerto Rico (PR), exceeding heart disease for the first time since 2012 (1). According to the Department of Health of PR, 5,219 deaths from cancer were reported in 2013 (2). Early detection through screening has been linked to a decrease in mortality for different cancers, such as breast, cervical, and colorectal cancer (CRC) (3–6). One of the most consistent predictors of cancer screening is a physician's recommendation (7–10). In 2014, with the aim of targeting primary care providers, the PR Community Cancer Control Outreach Program (Outreach Program), a joint effort of the University of PR and the University of Texas MD Anderson Cancer Center Partnership for Excellence in Cancer Research (grant U54CA096297/CA096300), collaborated with the PR Comprehensive Cancer Control Program (PRCCCP), the cervical cancer working group of the PR Cancer Control Coalition, and the PR Breast and Cervical Cancer Early Detection Program (PRBCCEDP) to develop and implement

capacity-building activities about breast, cervical, CRC screening and HPV vaccine guidelines targeted to physicians. The purpose of this study was to evaluate the impact of this educational activity on physician knowledge of breast, cervical and colorectal cancer screening and HPV vaccine.

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Methods

On April 25, 2014, we participated in the PR Academy of Family Physicians Annual Convention, at which we conducted 2 educational sessions, one being offered by the Outreach Program and the other by the PRCCCP. The first session featured a discussion of the screening and early detection guidelines for breast, cervical, and colorectal cancers of the American Cancer Society and the U.S. Preventive Services Task Force (3–6). The second session presented information regarding HPV, HPV-related cancers, and HPV vaccination guidelines, which information is in accordance with that of the Centers for Disease Control and Prevention (12) and the National Cancer Institute (13). An anonymous survey was administered before and after each activity, using an Audience Response System (ARS) to measure knowledge about the topics discussed and to gather demographic and work-related profiles of the physicians. This project was approved by the Institutional Review Board (IRB) of the University of PR Medical Sciences Campus (protocol A8060313).

Statistical analysis

Each physician's responses were assigned unique ID numbers, and the subsequent statistical analysis used data from only those physicians who answered and completed (via the ARS) both (pre and post) surveys. Univariate analysis was used to describe the complete study sample. Given the structure of the annual convention and the different times allocated for the 2 educational sessions, the number of physicians participating in each of the activities was not the same. Therefore, we conducted our pre-post analyses separately (one for the activity focusing on cancer screening guidelines and the other for the activity focusing on HPV and HPV vaccination). McNemar's test (with a significance level of 0.05) was used to determine whether there were significant differences—before and after a given session—in the participants' knowledge of the specific items discussed.

Results

Table 1 shows the demographic characteristics and a description of the services provided by the physicians that participated in the cancer screening–guidelines and HPV and HPV-vaccination activities. In both educational activities, the majority of the physicians were men over 50 years old, and most of the participants practiced general medicine and reported having a private practice. Half of the physicians (50.9%) that participated in the cancer screening–guidelines session indicated that they offered CRC screening services in their clinics. Regarding HPV, more than half of the participants (85.5%) that participated in the HPV educational activity did not provide the HPV vaccine at their offices. Moreover, most of the participants (64.9%) were not aware of the Vaccines for Children (VFC) program, though 77.6% evidenced being appropriately knowledgeable about HPV prior to the activity.

Table 1. Demographic characteristics of physicians who completed the educational activity about cancer screening guidelines and HPV

Demographic characteristics	Cancer Screening Guidelines (N=43) TOTAL (%)	HPV (N=67) TOTAL (%)
Sex		
Female	11 (25.6)	29 (43.3)
Male	32 (74.4)	38 (56.7)
Age group		
<35 years	3 (6.4)	7 (10.0)
35–50 years	12 (25.5)	22 (31.4)
>50 years	32 (68.1)	41 (58.6)
Specialty		
General medicine	28 (58.3)	34 (43.6)
Family medicine	12 (25.0)	31 (39.7)
Other*	8 (16.7)	13 (16.7)
Practice Type		
Private	35 (67.3)	52 (67.5)
Academic	3 (5.8)	5 (6.5)
Both	2 (3.8)	4 (5.2)
Other	12 (23.1)	16 (20.8)
Does your clinical practice provide breast cancer screening services?***		
Yes	33 (64.7)	-
No	18 (35.3)	-
Does your clinical practice provide CRC screening services?***		
Yes	27 (50.9)	-
No	26 (49.1)	-
Do you administer the HPV vaccine in your practice?****		
Yes	-	11 (14.5)
No	-	65 (85.5)
Are you aware of the Vaccines for Children Program?****		
Yes	-	26 (35.1)
No	-	48 (64.9)
How would you describe your knowledge of HPV?****		
Extensive	-	3 (4.0)
Sufficient	-	59 (77.6)
Poor	-	14 (18.4)

*Such as pediatrics, ob-gyn, internal medicine, and others not specified. **This question was answered only by participants who attended the cancer screening educational activity. *** This question was answered only by participants who attended the HPV educational activity. CRC: colorectal cancer; HPV: human papillomavirus

Table 2 shows the questions provided to the participating physicians regarding their general knowledge of the screening guidelines for breast, cervical, and colorectal cancers. A significant increase ($P < .0001$) between the overall mean score of the pre-test (3.3 ± 1.42) and post-test (6.7 ± 1.38) was observed. Specifically, the results of the McNemar's test showed that the participants' knowledge regarding the new cervical cancer screening guidelines (which involve new initiation and screening ages and revised testing frequencies in persons with negative results) and recommended guidelines for colonoscopy improved. On the other hand, no changes in the post-test were observed in terms of the age of initiation for the mammogram or for the fecal occult blood test (FOBT) recommendations ($P > 0.05$).

Significant differences ($P < .0001$) between the mean score of the pre-test (7.82 ± 1.44) and that of the post-test (9.66 ± 0.53) were observed in the HPV educational activity (Table 3). The results of the McNemar's test showed improvements in

knowledge, after the presentation, regarding the HPV serotypes associated with cervical cancer, the protection provided by and the doses of the vaccine, and the recommended age for the vaccine.

Table 2. General knowledge regarding breast, cervical, and colorectal cancers

Question	Pre-test n (%)	Post-test n (%)	McNemar's test P value
The American Cancer Society recommends a yearly mammogram for women aged 40 and over. True*	15 (75.0)	13 (65.0)	.69
The U.S. Preventive Service Task Force recommends a mammogram every 2 years for women aged 50 and over. True*	7 (35.0)	17 (85.0)	.01
New cervical cancer screening guidelines recommend that screenings should be initiated at the age of 21 years*	7 (35.0)	20 (100.0)	.0002
New cervical cancer screening guidelines recommend as the best screening strategy the combined use of cytology and an HPV test in women aged 30–65 years*	1 (5.0)	17 (85.0)	<.0001
Women aged 30–65 years with a negative result on their combined cytology and HPV screening test should repeat screening every 5 years*	2 (10.0)	13 (65.0)	.001
Colorectal cancer screening initiation in men and women without risk factors are recommended at the age of 50 years and over*	15 (75.0)	20 (100.0)	.06
The American Cancer Society and the U.S. Preventive Services Task Force recommend a colonoscopy every _____ (year/s) as a screening method for colorectal cancer in men and women aged 50 years and over. 10*	2 (10.0)	16 (80.0)	.0001
The American Cancer Society and the U.S. Preventive Services Task Force recommend FOBT testing every _____ (year/s) as a screening method for colorectal cancer in men and women aged 50 years and over. 1*	17 (85.0)	18 (90.0)	1.00
Average score**	3.3	6.7	<.0001

*correct answer; **paired t test was used. HPV: human papillomavirus; FOBT: fecal occult blood test

Table 3. Knowledge regarding HPV, HPV-related cancers, and the HPV vaccine

Question	Pre-test n (%)	Post-test n (%)	McNemar's test P value
The HPV infection is the most common sexually transmitted disease in the world. True*	19 (50.0)	37 (97.4)	<.0001
Cervical cancer is most commonly associated with HPV serotypes 16 and 18. True*	30 (79.0)	37 (97.4)	.02
Which of the following types of cancer is NOT associated with the HPV? Ovarian cancer*	37 (97.4)	38 (100.0)	1.00
In most cases, HPV disappears on its own, without causing any health problems. True*	34 (89.5)	31 (81.6)	.36
Only women are infected by HPV. False*	38 (100.0)	37 (97.4)	1.00
Two vaccines against HPV are available. True*	28 (73.7)	37 (97.4)	.01
Administration of the HPV vaccine is recommended for those who are 11 to 12 years old. True*	32 (84.2)	38 (100.0)	.03
The HPV vaccine protects against cervical cancer only. False*	23 (60.5)	37 (97.4)	.0001
The HPV vaccine can be administered only to women. False*	34 (89.5)	37 (97.4)	.38
The HPV vaccine requires the administration of three doses*	22 (57.9)	38 (100.0)	<.0001
Average score**	7.82	9.66	<.0001

*correct answer; **paired t test was used; HPV: human papillomavirus

Discussion

The Outreach Program, the PRCCCP, and the PRBCCEDP offered 2 educational activities targeting health care providers at an annual meeting of family physicians in PR and provided updated information on cancer prevention and early detection guidelines. Our findings showed that the educational activities increased the practitioners' knowledge of the screening guidelines for breast, cervical, and colorectal cancers; of HPV; and of HPV vaccination.

Regarding the first educational activity (cancer screening guidelines), we observed a significant increase in knowledge of the new cervical cancer screening guidelines. The increased knowledge about the frequency of and new algorithms for cervical cancer screening will help physicians encourage patients to both undergo screening and participate in other programs for cervical cancer screening on the island. An important role of general and family physicians is to encourage patients to undergo cancer screening. Screening programs in Australia have described the role of physicians as essential for further decreasing the prevalence of cancer through the early detection and treatment of cervical abnormalities (14).

Our study showed that 85% of the medical practitioners did not administer the HPV vaccine at their clinics and that only 32% knew about the VFC program. The Governmental Healthcare Program of PR, available for medically indigent citizens, covers approximately 40% of the Puerto Rican population (15). Although this study shows that there were significant improvements in the knowledge of the participants, efforts to reinforce and update this group of physicians regarding HPV infection, HPV-related cancers, and vaccination are still necessary. These efforts, in particular, should align with recommendations from the Advisory Committee on Immunization Practices (ACIP), which now recommends that 11- to 12-year-olds receive 2 doses of the

HPV vaccine at least 6 months apart rather than the previous guidelines, which recommended 3 doses to protect against cancers caused by the HPV infection (16). Educational activities aimed at promoting physician knowledge of HPV vaccination (such as the one described herein) are needed to increase the capacity of the practices of these health professionals. Physicians require the latest and best ready-to-use tools and resources to aid them in communicating effectively with parents who are vaccine hesitant and, it is hoped, increase HPV vaccination uptake.

Even though the implementation of the educational activities and the collaboration between our community and clinical partners were favorable, some challenges emerged. Due to the dynamic of the annual meeting, it was not possible to have a fixed cohort that would enable us to evaluate the effectiveness of the 2 activities. Therefore, the number of participants who completed both the pre- and the post-test items varied; the previously mentioned lack also resulted in a decrease in the overall sample, thus affecting the calculation of the knowledge score. Despite these limitations, the findings of this study support the importance of continuing-education activities for physicians. It is important that activities such as those described in this article be continued and that strategies to strengthen, update, and expand them be developed.

In summary, collaborative efforts in the development of educational activities for cancer prevention and control have been shown to significantly increase physician knowledge of cancer screening guidelines, HPV, and HPV vaccination. Although recent metrics (2018) showed high rates of screening for breast cancer on the island (compared to national estimates), greater efforts are needed, given that lower rates were observed for CRC (both FOBT and colonoscopy screening) (11). Regarding HPV vaccination, the rates in PR are considerably higher than those of most states and jurisdictions, with said rates being close to the Healthy People 2020 goal of 80% (17). This is due the recent institution of an HPV vaccination school-entry policy for boys and girls aged 11 to 12 years (18). As for breast and cervical cancer, future efforts need to focus on addressing missed opportunities for screening in women younger than 50 years old; research studies performed in the community have determined that women aged 50 to 59 years are more likely (than women of any other age) to never have had a mammography (19). Regarding CRC, new strategies to actively promote CRC screening among non-adherent individuals are needed.

Lastly, despite milestones in policy implementation and high HPV vaccination rates on the island, the described partnership should also consider disseminating the ACIP recommendations regarding the use of a 2-dose schedule for the HPV vaccination for children who are 11- to 12-years-old. Such a dissemination should also include information about the approval of a 9-valent HPV vaccine for use in women and men aged 27 to 45 years, as well as a discussion of emerging sociobehavioral factors that impact vaccination, as part of the communication strategies for hesitant parents.

Resumen

Objetivo: Este estudio evaluó el conocimiento de los médicos sobre las guías de cernimiento de cáncer y las recomendaciones para la vacunación contra el virus de papiloma humano (VPH). **Métodos:** El Programa de Alcance Comunitario para el Control de Cáncer de Puerto Rico en colaboración con el Programa Comprensivo de Control de Cáncer y el Programa de Detección Temprana de cáncer de mama y cáncer uterino de Puerto Rico desarrollaron una actividad educativa dirigida a médicos que asistieron a una conferencia anual. La actividad consistió en 2 secciones: una sobre guías de cernimiento de cáncer y a otra sobre VPH y vacunación contra el VPH. Se administró un cuestionario para medir conocimiento de los temas presentados antes y después de la secciones. Para determinar si habian diferencias significativas, se utilizó la prueba de McNemar a un nivel de significancia de 0.05. **Resultados:** Un total de 43 médicos respondieron la encuesta sobre cernimiento de cáncer y 67 la encuesta sobre VPH. Los resultados demuestran un aumento significativo en el valor promedio de la pre-prueba (3.3 ± 1.42) y la post-prueba (6.7 ± 1.38) para las guías de cernimiento de cáncer y también para la pre-prueba (7.82 ± 1.44) y la post-prueba (9.66 ± 0.53) en el conocimiento sobre el VPH. **Conclusión:** Esta actividad educativa mejoró significativamente el conocimiento entre los médicos de cuidado primario. Esfuerzos futuros deberán discutir las guías de cáncer más recientes y los factores socio-conductuales emergentes que impactan la vacunación.

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