Characteristics of smokers accessing the Puerto Rico Quitline

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***Background*: In 2004, the Puerto Rico Department of Health implemented the Puerto Rico Quitline (PRQ), a proactive, telephone-based smoking cessation counseling program. This study examines the demographic and smoking-related characteristics of the individuals served by the PRQ.**

***Methods*: Analyses included PRQ participants registered from December 2004-December 2005. PRQ call rates and rate ratios (RR) were calculated overall, among smokers, and stratified by relevant covariates. Associations between sex and relevant characteristics of PRQ participants were compared using regression models.**

***Results*: Call rates per 100,000 smokers in PR were lower among men than women (RR=0.50, 95% CI=0.44-0.56), and higher among all age groups ≥ 25 years of age as compared to those aged 15-24 years (RRs= 4.34-8.14) and among smokers living in the San Juan metropolitan area relative to smokers residing outside the metropolitan area (RR=1.45, 95% CI=1.29-1.63). Mass media was the most common way in which participants learned about the PRQ (>70%), with only 2-3% of callers reporting a physician's referral as the source of their information about the PRQ. With respect to reasons for quitting, men were less likely than women to report concern about a child's health (OR=0.62, 95% CI=0.46-0.84) and cigarette odor (OR=0.64, 95% CI=0.41-0.99). Meanwhile, men were more likely (OR=1.39, 95% CI=1.01-1.91) to report the influence of other smokers as a barrier during quitting.**

***Conclusions*: PRQ promotion and outreach efforts should target populations underserved by the PRQ including male, young adult, and non-metropolitan area smokers. Initiatives that link the PRQ with primary care providers in promoting smoking cessation should be encouraged.**

Key words: Quitline, Tobacco cessation programs, Telephone counseling, Puerto Ricans.

Smoking is the leading cause of preventable morbidity and mortality in the United States (1-2). Although the prevalence of smoking among Puerto Ricans living in Puerto Rico is lower (13.1%) than among the U.S. general population (20.6%) (3), five of the seven leading causes of death in Puerto Rico (heart disease, malignant tumors, cerebrovascular diseases, hypertensive diseases and chronic pulmonary disease) are associated with smoking (4). Moreover, 11.5% of all deaths and 10% of all health care costs in Puerto Rico are attributable to smoking (5). Therefore, reducing tobacco use is a critical public health concern. In addition, over 60% of current smokers in Puerto Rico report that they want to quit smoking (6) highlighting the importance of promoting smoking cessation among the Puerto Rican population.

A key component of national tobacco control efforts in the U.S. is the provision of smoking cessation programs to all interested smokers through the North American Quitline Consortium (7). The effectiveness of proactive telephone counseling for smoking cessation has been empirically demonstrated among both the general population and Hispanic smokers (8-9). Unfortunately, there is some evidence to suggest that the use of quitlines by Hispanic smokers may be low and that increased efforts to reach this population are necessary (9).

In 2004, the Puerto Rico Department of Health implemented the Puerto Rico Quitline (PRQ). The PRQ is a proactive telephone-based smoking cessation program funded by the Centers for Disease Control and Prevention. Individuals can call the PRQ directly (phone number 1-877-335-2567) or be connected automatically when calling the national quitline number (phone number

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1-800-QUIT-NOW). When a caller reaches the PRQ for the first time, he or she provides personal and demographic information and establishes a quit date within the next 30 days. Prior to the quit date, a Quit Kit containing self-help materials and other items (e.g., stress ball) is sent to participants via regular mail. Up to 8 proactive counseling calls are made to participants by PRQ's trained cessation counselors. Each of these calls involves up to 3 calling attempts in order to contact the participant. Proactive calls start the day before the established quit date and end within a year. Some promotional campaigns are launched throughout the year by the PRQ such as a Quit & Win contest and during the World No Tobacco Day activities.

The purpose of the current study is to describe the demographic and smoking-related characteristics of individuals served by the PRQ. A better understanding of the smokers accessing the PRQ is essential for program evaluation and can facilitate identification of specific sub-groups of Puerto Rican smokers who may be underserved by the PRQ. Such data can facilitate the targeting of PRQ's promotional and outreach efforts.

Methods

Participants and procedures

During its first year of operation (from December 22, 2004 to December 31, 2005), 1,604 callers registered in the PRQ, and 1,323 (82.5%) of those callers completed an interview in which they provided demographic, lifestyle, and health information. Institutional Review Board approvals for secondary data analyses were provided by the University of Puerto Rico, Medical Sciences Campus and The University of Texas M. D. Anderson Cancer Center.

Study variables

Demographic information included: sex (male/female) and age (15-24, 25-34, 35-44, 45-54 and 55-64, ≥65 years). In addition, callers from any of the seven municipalities that compose the San Juan metropolitan area (Carolina, Trujillo Alto, San Juan, Guaynabo, Bayamón, Toa Baja, and Cataño) were differentiated from those calling from other regions of the island using the variable metropolitan area (yes/no).

Tobacco-related data included: number of years smoking, time of first cigarette consumed daily (≤ 30 minutes/>30 minutes), desire to stop smoking in the next 30 days (yes/no), number of attempts to stop smoking in the past, reasons for wanting to stop smoking [family request (yes/no); health improvement (yes/no); cost (yes/no); cigarette odor (yes/no); made a promise (yes/no); physician advice (yes/no); child's health (yes/no); tired of smoking (yes/no); and self-control (yes/no)]. Respondents also indicated which of the following were barriers to quitting: withdrawal symptoms (yes/no), weight gain (yes/no), influence of other smokers (yes/no), and unsuccessful attempts (yes/no). In addition, participants reported how they had learned about the PRQ [mass media (written press, TV, radio, web, and written advertisement), physician's referral, brochure, family/friend, or other]. This last question was not part of the PRQ interview until its seventh month of operation.

Statistical Analysis

The rates of smokers who registered with the PRQ (per 100,000 total population) were calculated by dividing the number of PRQ callers by the overall population according to the Census 2005 population projections of persons living in Puerto Rico (10). Rates of registered callers were also calculated for the estimated number of smokers aged 18 years old and older who were living in Puerto Rico according to the Behavioral Risk Factor Surveillance Survey 2005 (BRFSS) (3). The BRFSS is a population-based survey conducted annually in the United States and Puerto Rico. For both the overall population and the smoking population, rates of registered smokers were calculated specifically by sex and age group, also using Census 2005 projections and BRFSS 2005 data. Because the BRFSS does not provide prevalence estimates of current smoking in Puerto Rico by municipality, the rate of registered smokers by metropolitan area of residence (overall and among smokers) was calculated using as a reference the prevalence of smoking by municipality in Puerto Rico for the year 2003, according to the Continuous Health Survey for the Municipalities of Puerto Rico, an annual population-based household interview survey conducted in the Island (6).

The rate ratio (RR) and 95% Confidence Intervals (CI) for the registration call rates were calculated using Poisson regression models (11). Contingency tables were used to describe the frequency distributions of study variables by sex. In addition, the crude and age-adjusted associations between sex and relevant characteristics of PRQ participants were compared using logistic regression models (11) and polytomous logistic regression models (12). Likelihood ratio tests were used to evaluate the potential effect modification of age on the association between sex and outcome variables within the models (12).

Results

Registration rates

PRQ call rates per 100,000 total population and per 100,000 smokers by demographic characteristics are shown in Table 1. In general, similar rates of males and

females accessed the PRQ during the study period; callers were largely middle-aged and resided in the metropolitan area of Puerto Rico. The overall rate of registered callers from December 2004-December 2005 was 34 per every 100,000 people and 373 per 100,000 smokers. Although the call rates were approximately equal for men and women in the general population, the call rate was 50% lower among the male smoking population when compared to the female smoking population (RR=0.50, 95% CI=0.44-0.56). Overall and smoking population call rates were higher in each of the age groups of 25 years and older than among those 15-24 years old, and were highest among individuals 35-44 years old. Individuals living in the metropolitan area also had higher call rates compared to those living in the non-metropolitan area (RR=1.45, 95% CI=1.29-1.63).

Characteristics of PRQ callers

Regarding their smoking history, the majority of callers were interested in quitting within the next 30 days, smoked within the first 30 minutes of awakening (Table 2), and had tried to quit previously (median= 3.0 times) (data not shown). Average duration of years smoking in this population was 23.0 ± 13.5 years, and did not differ by sex (data not shown). When asked about the reasons for wanting to quit smoking, over 90% of smokers mentioned they were tired of smoking and more than 80% reported an interest in improving their health. Only about 5% of smokers reported advice from a physician as a reason for their interest in quitting. Withdrawal symptoms were the most frequently cited difficulty encountered when trying to quit (reported by over 60% of smokers). Mass media was the most common way in which participants learned about the PRQ (reported by approximately 70% of smokers). Only 2-3% of callers reported a physician's referral as their source of information about the PRQ.

There were significant sex differences on several characteristics. Men were less likely than women to cite a child's health (OR=0.62, 95% CI=0.46-0.84) and cigarette odor (OR=0.64, 95% CI=0.41-0.99) as reasons for wanting to quit. Men were more likely than women to report the influence of other smokers as a barrier during smoking cessation (OR=1.39, 95% CI=1.01-1.91). Meanwhile, a significant interaction between age and sex was observed for the variable weight gain, where only in the age group of 34 to 45 years men were less likely than women to report that weight gain represented a difficulty for smoking cessation (OR=0.13, 95% CI=0.04-0.39) (data not shown).

On the other hand, no differences were observed between men and women in the following reasons for wanting to stop smoking: health improvement, tired of smoking, family request, money spent, physician advice, want to have control and made a promise. In addition, no sex differences were observed regarding withdrawal symptoms and unsuccessful attempts as barriers to stop smoking; nor in the way in which men and women learned about the PRQ.

Table 1. Registration call rate (per 100,000 individuals) and rate ratios (RR) by sex, age and area of residence among the overall population and among smokers (n=1323).

	n (%)	Rate Among the Overall Population (per 100,000 population)	RR (95% CI)[f]	Rate Among Smokers (per 100,000 smokers)	RR (95% CI)[f]
Overall	1323	33.67	--	372.71	--
Sex[a, d]					
Female	685 (51.9)	25.75	1.00	417.60	1.00
Male	634 (48.1)	25.28	0.98 (0.87, 1.11)	208.42	0.50 (0.44, 0.56)
Age group (years)[b, d]					
15-24	39 (3.2)	5.74	1.00	57.61	1.00
25-34	236 (19.1)	39.20	6.83 (4.78, 9.76)	249.78	4.34 (3.03, 6.20)
35-44	320 (26.0)	53.73	9.36 (6.59, 13.30)	469.14	8.14 (5.73, 11.57)
45-54	354 (28.7)	66.16	11.53 (8.13, 16.34)	401.64	6.97 (4.92, 9.88)
55-64	199 (16.1)	42.88	7.47 (5.20, 10.74)	390.78	6.78 (4.72, 9.75)
≥65	85 (6.9)	15.79	2.75 (1.84, 4.10)	267.54	4.64 (3.11. 6.93)
Metropolitan area[c, e]					
No	712 (60.0)	24.99	1.00	232.93	1.00
Yes	474 (40.0)	40.84	1.63 (1.45, 1.84)	338.24	1.45 (1.29, 1.63)

Missing values: a = 4, b = 90, c = 137
d = Rates calculated using Census 2005 projections and BRFSS 2005 population estimates.
e = Rates among smokers calculated using current smoking by municipality according to the Continuous Health Survey for the Municipalities of Puerto Rico, 2003.
f = RR calculated using the Poisson Model.

Discussion

The present study showed that although the overall reach of the PRQ is generally congruent with that of other quitlines, comparisons of the

Table 2. Crude and age-adjusted associations between sex and relevant characteristics of PRQ participants (n=1183).

Characteristics	Sex	n (%)	OR Crude (95% CI)	OR Age Adjusted (95% CI)
Want to stop smoking in the next 30 days	Male	549 (96.8)	1.45 (0.79, 2.66)	1.48 (0.81, 2.72)
	Female	588 (95.5)	1.00	1.00
Smoke within 30 minutes of awakening	Male	463 (81.7)	0.76 (0.56, 1.04)	0.77 (0.56, 1.05)
	Female	526 (85.4)	1.00	1.00
Previously tried to stop smoking	Male	505 (89.0)	1.29 (0.91, 1.83)	1.27 (0.89, 1.80)
	Female	532 (86.3)	1.00	1.00
Reasons for wanting to stop smoking				
Health improvement	Male	474 (83.6)	1.13 (0.84, 1.53)	1.18 (0.87, 1.60)
	Female	504 (91.8)	1.00	1.00
Child's health	Male	102 (18.0)	0.69 (0.52, 0.91)	0.62 (0.46, 0.84)
	Female	149 (24.8)	1.00	1.00
Tired of smoking	Male	526 (92.8)	0.96 (0.62, 1.50)	0.96 (0.61, 1.50)
	Female	573 (93.0)	1.00	1.00
Family request	Male	76 (13.4)	1.08 (0.77, 1.52)	1.11 (0.79, 1.56)
	Female	77 (12.5)	1.00	1.00
Cigarette odor	Male	35 (6.2)	0.64 (0.42, 1.00)	0.64 (0.41, 0.99)
	Female	57 (9.3)	1.00	1.00
Money spent	Male	136 (24.0)	1.12 (0.86, 1.47)	1.08 (0.82, 1.42)
	Female	132 (21.4)	1.00	1.00
Physician advice	Male	31 (5.5)	1.02 (0.62, 1.69)	0.98 (0.59, 1.64)
	Female	33 (5.4)	1.00	1.00
Have control	Male	25 (4.4)	0.87 (0.51, 1.49)	0.88 (0.51, 1.52)
	Female	31 (5.0)	1.00	1.00
Made a promise	Male	10 (1.8)	0.99 (0.42, 2.34)	1.00 (0.42, 2.38)
	Female	11 (1.8)	1.00	1.00
Difficulties encountered to stop smoking				
Withdrawal symptoms	Male	341 (60.1)	0.88 (0.70, 1.11)	0.87 (0.69, 1.10)
	Female	389 (63.1)	1.00	1.00
Influence of other smokers	Male	103 (18.2)	1.43 (1.04, 1.95)	1.39 (1.01, 1.91)
	Female	83 (13.5)	1.00	1.00
Unsuccessful attempts	Male	61 (10.8)	1.12 (0.77, 1.63)	1.15 (0.79, 1.68)
	Female	60 (9.7)	1.00	1.00
Weight gain[a]	Male	32 (5.6)	--	--
	Female	70 (11.4)	--	--
How did you learn about the PRQ?[b, c]				
Mass media	Male	249 (74.1)	1.00	1.00
	Female	261 (71.2)		
Physicians referral	Male	7 (2.0)	0.67 (0.25, 1.75)	0.65 (0.25, 1.71)
	Female	11 (3.0)		
Family/friend	Male	26 (7.7)	1.18 (0.66, 2.13)	1.18 (0.66, 2.13)
	Female	23 (6.3)		
Brochure	Male	5 (1.5)	1.05 (0.30, 3.66)	1.04 (0.30, 3.65)
	Female	5 (1.4)		
Other	Male	49 (14.6)	0.77 (0.51, 1.15)	0.78 (0.52, 1.17)
	Female	67 (18.3)		

a = Significant interaction by sex. b = 703 respondents c = Estimates using polytomous logistic regression model with "Mass media" as the reference group.

people enrolled across demographic characteristics suggest that certain groups may be underserved relative to others, and that targeted promotional and outreach strategies should be considered.

Consistent with results from other quitlines in the U.S., PRQ callers were predominantly long-term smokers with 95% planning to quit within the next 30 days, and almost 86% having tried to quit previously (13-16). Further, a very high proportion of callers smoked within 30 minutes of awakening, an indicator of tobacco dependence; and withdrawal symptoms were the most commonly reported barrier to quitting (60%). In addition, females aged 34 to 45 years were more likely than men in this age group to report that weight gain represented a difficulty for smoking cessation. Even though this association was observed only in this age group, the direction of the effect is consistent

with previous studies (15-17). Finally, men were more likely than women to report the influence of other smokers as a barrier to quitting (18).

Also congruent with previous studies, health improvement was cited as one of the principal reasons for wanting to quit smoking (15). However, only 5.5% of smokers reported that a physician's advice was a reason for their interest in quitting. This finding suggests that physicians are either not advising this population to quit or that, if advice is given, it has not been effective in motivating the decision to quit. Future studies should further address this issue in Puerto Rico, as the 2000 National Health Interview Survey and other surveys performed in the U.S. have shown that Hispanics are less likely to receive smoking cessation advice from their doctor as compared to other racial/ethnic groups (19-20).

Overall, the reach of the PRQ among smokers in Puerto Rico is substantially lower than that of other quitlines around the world. The PRQ's annual call rate of 373 per 100,000 smokers is much lower than the monthly call rate reported by New Zealand's National Quitline (272 and 395 per 100,000 smokers) (21). In addition, on an annual basis, less than 1% of the population of smokers in Puerto Rico registered with the PRQ, whereas 4.2% of the population of adult smokers in England called their quitline (22). Thus, there is substantial room for improving the reach of the PRQ. Several factors that may have contributed to lower call rates than those found in New Zealand and England include the newness of the PRQ (data are from the first year of operation) and the extremely limited promotional budget of approximately $30,000 annually (A. Cases, MPA, Puerto Rico's Health Department Tobacco Control and Prevention Division, personal communication, January 17, 2007).

Variations in the rates of registered callers were observed by sex, age group, and area of residence. Specifically, the rate of registered callers per 100,000 smokers was 50% lower among men than women. This finding is consistent with numerous other quitlines (13-14, 22-23), but may be of special concern in Puerto Rico because of the much higher smoking prevalence among males than females (18.0% vs. 8.7%) (3). Similarly, while telephone counseling has been shown to increase cessation rates among young smokers in the U.S. (24), the smoking population call rates were much higher among all other age groups when compared to the 15-24 year-old group ($4.34 \leq RR \leq 8.14$). Young adult smokers have been well represented among quitlines' callers in Massachusetts (13), California (14), and Hong Kong (23) suggesting that current PRQ promotional and outreach efforts have not been very effective in reaching this population. Finally, smokers in non-metropolitan areas of Puerto Rico were less likely to call the PRQ than were smokers in the San Juan metro area. Overall, these results suggest that male, young adult, and non-metropolitan smokers are currently underserved by the PRQ.

With respect to their source of information about the PRQ, 73% of callers reported learning about the quitline through mass media, whereas only 2.4% of callers reported a physician's referral as their source of information, consistent with other quit lines (14). This finding might be expected given that over 80% of the PRQ promotional budget is used for mass media advertisement (A. Cases, MPA, Puerto Rico's Health Department Tobacco Control and Prevention Division, personal communication, January 17, 2007). Data suggesting that Spanish speakers heavily rely on the media as a source of information about tobacco cessation quitlines (14), and the current results support that physician advice is not a primary reason for quitline utilization.

Results from the current study largely mirror those of previous quitline studies with respect to the characteristics of callers, but not with respect to the reach of the PRQ. Reach is particularly low among male, young adults, and non-metropolitan area smokers. Therefore, promotional and outreach strategies will need to specifically target these groups as they appear underserved by the PRQ. Because the PRQ has a low promotion budget, efforts should be made to develop and maintain low budget mass media campaigns capable of attracting more smokers interested in quitting, and in utilizing other low cost strategies to increase call volume. Based on the low rate of physician referral as a source of information about the PRQ, outreach initiatives aimed at increasing the involvement of primary care physicians and other health care professionals in referring their patients to the PRQ appear warranted. This strategy also has the potential for being not only effective, but sustainable and relatively low-cost (25-26).

A major impetus to increase utilization of the PRQ will contribute to the development of a comprehensive tobacco control program for Puerto Rico. For a comprehensive control program to be successful and widely accepted, the involvement of government, academia, community-based organizations, and health care professionals is essential. Because none of the tax recovered from the sales of cigarettes in Puerto Rico and only 2% of the money assigned to the Island as part of the Master Settlement Agreement (27) is currently targeted at tobacco prevention and control efforts, a redirection of at least a portion of these funds could be used to develop and maintain a comprehensive tobacco control program in Puerto Rico. Unfortunately, as it happens in other states, tobacco control efforts remain under-funded relative to

the disease burden resulting from tobacco use (28). On a positive note, the government of Puerto Rico recently passed an amendment to the Law to Regulate the Practice of Smoking in Public Places, which prohibits smoking in public and private workplaces among others in Puerto Rico (29). Similar legislation in other countries (21, 26, 30-32) has demonstrated that such laws reduce cigarette consumption and promote smoking cessation. Future research should be able to evaluate, among others, the effect of this law on quitline usage. Therefore, the PRQ will continue to play a central role in tobacco control efforts in Puerto Rico.

Resumen

En el 2004, el Departamento de Salud de Puerto Rico implantó la Línea de Cesación de Puerto Rico (PRQ, por sus siglas en inglés), un programa de consejería telefónica para la cesación de fumar. Este estudio examina las características demográficas y las relacionadas al uso de cigarrillo de los participantes del PRQ. El análisis comprende los participantes registrados desde diciembre de 2004 hasta diciembre de 2005. Las tasas de llamadas al PRQ, así como la razón de tasas (RR, por sus siglas en inglés) fueron calculadas para toda la población y para los fumadores, y estratificadas según las variables de interés. La asociación entre el sexo y las características relevantes de los participantes del PRQ fue comparada con modelos de regresión. La tasa de llamadas por cada 100,000 fumadores en Puerto Rico fue menor en hombres que en mujeres (RR=0.50, 95% CI=0.44-0.56) y mayor en los grupos de edad de personas sobre 25 años en comparación con aquellos de 15-24 años (RR= 4.34-8.14), y en los fumadores que residen en el área metropolitana de San Juan en comparación con los fumadores que residen fuera del área metropolitana (RR=1.45, 95% CI=1.29-1.63). Los medios de comunicación fueron la manera más común a través de la cual los participantes conocieron del PRQ (>70%). Solamente, de un 2-3% informaron que conocieron del PRQ a través de un referido médico. En cuanto a las razones para dejar de fumar, los hombres mostraron menos preocupación que las mujeres por la salud de sus hijos (OR=0.62, 95% CI=0.46-0.84) y el olor de cigarrillo (OR=0.64, 95% CI=0.41-0.99). Por otro lado, los hombres consideraron la influencia de otros fumadores (OR=1.39, 95% CI=1.01-1.91) como una dificultad para dejar de fumar. Los esfuerzos para promocionar el PRQ deben dirigirse a poblaciones poco atendidas, que incluyen hombres, jóvenes adultos y fumadores fuera del área metropolitana. Igualmente, deben promoverse iniciativas que integren el PRQ con los proveedores primarios de salud en la cesación de fumar.

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