Descriptive Profile of People with Diabetes Who Use the Puerto Rico Quitline

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Objective: To provide a descriptive profile of the people with diabetes (PWD) who received the services of the Puerto Rico Quitline (PRQ) during 2008, compared to non-diabetic people (NDP) to establish a significant statistical difference.

Methods: Using a cross-sectional study methodology, the Quitline database was analyzed. Ninety-four percent of the 1,137 people who received the services of the PRQ during 2008 and completed all the interviews were included in the analysis. Frequency distributions and means calculation were performed to describe the PWD. Chi-square tests, odds ratio, *t* test and 95% confidence intervals were calculated to identify statistically significant differences between the PWD and NDP.

Results: Nearly 11 percent (10.9%) of the people who received the services of the PRQ during 2008 and completed all the interviews reported a diabetes diagnosis. Health conditions were reported by 95.7% of PWD vs 62.3% of NDP ($P<.01$). People with diabetes were more likely to have hypertension ($P<.01$), circulatory problems ($P<.01$), and respiratory infections ($P=.02$) than NDP. They also reported a higher mean number of smoking years than the NDP ($P<.01$), but the PWD were less likely to use menthol cigarettes than NDP ($P=.01$). A physician's recommendation is the only reason for trying to quit smoking with a statically significant difference between the PWD and the NDP ($P=.02$). The mean number of alcoholic beverages consumed per day for the PWD was 8 and for the NDP it was 5 ($P<.01$).

Conclusion: This study provides important evidence that can help increase the chances of success in the smoking cessation process in the PWD who access the services of the Quitline program. (*Ethn Dis.* 2012;22(1):45–50)

Key Words: Tobacco, Diabetes, Smoking Cessation, Quitline, Puerto Ricans, Hispanics

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Introduction

Cigarette smoking is considered to be the cause of four million deaths annually throughout the world.[1,2] It is estimated that by the year 2030, more than 10 million people will die annually of cigarette-related afflictions.[1] But at the same time, it has been estimated that if the adult consumption were to decrease by 50%, by the year 2020, approximately 180 million tobacco-related deaths could be avoided.[3,4] Tobacco consumption has been correlated with the development of a variety of chronic diseases. In addition, cigarette smoking causes substantial morbidity; smokers report more acute and chronic symptoms than people who have never smoked.[5] For people with diabetes (PWD), tobacco use increases the risk of developing complications including nephropathy, retinopathy, neuropathy and cardiovascular disease, among others. The risk of coronary heart disease is two times greater in a person with diabetes when compared to a non-diabetic person (NDP); therefore, the risk of coronary heart disease in a smoking diabetic could be 4 to 6 times greater than in a non-smoking non-diabetic.[5] Also, smoking increases the secretion of catecholamine, growth hormones and cortisol, a hormone that counteracts insulin action and could thus lead to increased insulin requirements in diabetic patients.[5] In addition, the risk of death in this population is 25% higher in patients who had smoked for >10 years than in those who have never smoked, and is clearly higher than that in patients who have more recently stopped smoking.[6] Smokers with diabetes tend to be less actively involved in their diabetes care than are non-smokers.[7] This population frequently explains their inability to stop smoking by saying they are already too restricted by the diabetic treatment regimen, particularly the diet, and that they develop a craving for cigarettes when deprived of nicotine.[5,8] For these reasons, tobacco dependence should be recognized as a chronic illness that requires effective treatment as long as the condition exists.[9]

Currently, Puerto Rico is one of the jurisdictions with the most restrictive and comprehensive legislation in tobacco control use and protection of secondhand smoke exposure in the entire United States.[10] During the past fifteen years, there have been many efforts to reduce tobacco consumption in Puerto Rico. The four major achievements made by these efforts are: 1) the creation of the Coalition for a Tobacco Free Puerto Rico (CTFPR) (1993) composed of representatives of public and private agencies and representatives of the academia; 2) the implementation of the Puerto Rico Quitline (PRQ) (2004). The PRQ (1-877-DEJALOS) provides free professional telephone counseling to quit smoking for PR residents. The tobacco cessation services are provided by health professionals who offer counseling and coaching in the identification of situations and circumstances that trigger the need of smoking among the participants, identifying also new alternatives to manage those situations without the use of tobacco products, 3) the approval of Act No. 66 that amended Act No. 40 of

August 3, 1993 (act to regulate smoking in certain public and private places) (2007); and 4) the Tobacco Control Summit (TCS) (2002–2008 and in 2010). The TCS brings together experts in the field for discussing tobacco prevention topics with health professionals and the general public.

According to the 2008 Puerto Rico Behavioral Risk Factor Surveillance System (PRBRFSS), the prevalence of smoking in the general population decreased from 14.5% in 1996 to 11.6% in 2008.[11] A similar tendency was observed in people with diabetes; the prevalence of smoking in this population decreased from 9.2% in 2000 to 8.0% in 2008.[11] Considering the risk of developing more chronic complications in PWD who smoke, this study provides a descriptive profile of the PWD who received the services of the PRQ during 2008, and compares them with non-diabetic people (NDP) to know the special needs of this population, thereby increasing the chances of success in the smoking cessation process.

METHODS

The analysis of a secondary database provided by TeleMedik (provider of PRQ services) was performed using a cross-sectional study methodology. Statistical analyses were done with the Statistical Package for the Social Sciences (SPSS). This database contains sociodemographic, clinical, tobacco and alcohol consumption characteristics of the population who access the service. In the first part of the study, the data was cleaned and people who did not complete all the interviews were excluded. For this reason, 94% (1,064) of the 1,137 people who received the services of the PRQ during 2008, and completed all the interviews, were included in the analysis. In the second part of the study, a univariate analysis was performed using frequency distributions and means calculation. This analysis was performed to obtain a descriptive profile of the PWD. Finally, in the third part of this study, PWD and NDP were compared to identify statistically significant differences. This comparison was performed through a bivariate analysis using chi-square tests, odds ratio, *t* test and 95% confidence intervals.

This study provides a descriptive profile of the people with diabetes who received the services of the Puerto Rico Quitline during 2008.

RESULTS

People with Diabetes

Among the 1,064 individuals who received counseling to quit smoking by the PRQ during 2008 and completed all the interviews, 10.9% reported a diabetes diagnosis. In terms of sex of the PWD, the distribution was equal (50% females, 50% males). The mean age was 51 years and the group with more participants was 45–54 years (34.5%) followed by the 55–64 years (25.0%) group, 35–44 years (19.0%), ≥65 years (12.0%), 25–34 years (8.6%) and 18–24 years (.9%). At the same time, 31.0% reported having three years or less of university or technical school studies. The most successful promotion of the PRQ among this group was the written press with 31.0%.

The mean number of smoking years for the PWD was 29, and the mean age to start smoking regularly was 19. Among the PWD, 97.4% reported smoking daily (the mean number of cigarettes used per day was 21). In addition, 84.5% reported smoking their first cigarette during the first half hour after awakening. Nearly 88% (87.9%) reported using regular cigarettes and 37.9% reported using menthol cigarettes. In terms of quitting smoking, 99.1% reported wanting to quit over the next 30 days after calling the PRQ. The most prevalent reason for trying to quit smoking with the counseling of the PRQ was to improve their health (89.7%). These people also reported that the biggest obstacle that may interfere with the process of quitting was the withdrawal symptoms (55.2%). More than 90% (90.5%) reported having tried to quit before, and the mean number of attempts was 5. These people reported more than one reason to start smoking again, but the most prevalent was the uncontrollable desire to smoke (29.5%). Forty-four percent (44.0%) reported using medication for smoking cessation, and the most prevalent was the nicotine patch (58.8%).

Nearly 33% (32.8%) of the PWD reported alcohol consumption. Among those who drank, the mean number of drinks per day was 8.

Finally, in the clinical interview, 95.7% of the PWD reported having health conditions. The mean number of health conditions in PWD was 5, and the most prevalent condition reported was hypertension 53.2%.

People with Diabetes vs Non-diabetic People

In the PWD, the distribution by sex was equal but in the NDP, more than half were females (54.4% female). The mean age for the PWD was 51 years and for the NDP was 42 years ($P<.01$) (Table 1). The most prevalent age group in the PWD was 45–54 years with 34.5% and in the NDP was 35–44 years with 25.5% ($P<.01$). Thirty-one percent of the PWD reported having three years or less of university or technical school studies and 29.7% of the NDP reported having completed high school. The most successful promotion of the PRQ among the PWD and the NDP was the written press (31.0% vs 32.3% respectively).

Table 1. Continuous variables with statistically significant differences between PWD and NDP

Variables	PWD		NDP				
	mean	SD	mean	SD	*t*	*P*	95% CI
Age	51	11.45	42	12.74	6.64	<.01	5.80, 10.6
Smoking years	29	13.84	22	12.57	5.71	<.01	4.69, 9.60
Numbers of drinks per day	8	8.72	5	4.31	3.50	<.01	1.61, 5.75
Number of health conditions	5	2.85	3	2.22	8.52	<.01	1.47, 2.37

PWD, people with diabetes; NDP, non-diabetic people

The PWD had a higher mean number of smoking years (29 years) compared with the NDP (22 years) ($P<.01$) (Table 1). The mean age to start smoking regularly was higher in the PWD (19 years) compared with the NDP (18 years). Nearly all PWD (99.1%) reported smoking daily vs 96.9% of the NDP while the mean number of cigarettes used per day by the PWD was 21 vs 19 in the NDP. In addition, 84.5% of the PWD and 83.3% of the NDP reported smoking their first cigarette during the first half hour after awakening. In terms of the types of cigarettes used, 87.9% of the PWD and 85.8% of the NDP reported using regular cigarettes. It's important to mention that 51.8% of the NDP and 37.9% of the PWD used menthol cigarettes ($P=.01$) (Table 2). In terms of quitting smoking, 99.1% of the PWD and 98.3% of the NDP reported wanting to quit over the next 30 days after calling the PRQ. Among the reasons for trying to quit smoking with the counseling of the PRQ, the most prevalent for the PWD and the NDP was to improve their health (89.7% vs 87.6% respectively) (Table 2). However, a physician's recommendation is the only reason for trying to quit smoking with a statically significant difference between the PWD and the NDP (10.3% vs 5.1%) ($P=.02$). The biggest obstacle that may interfere with the process of quitting reported by the PWD and the NDP was the withdrawal symptoms (55.2% vs 53.6%). Nearly 91% (90.5%) of the PWD and 92.3% of the NDP reported having tried to quit before, and the mean number of attempts was 5 and 4 respectively. The biggest reason to start smoking again reported by the PWD and the NDP was the uncontrollable desire to smoke (29.5% vs 26.9%). Forty-four percent of the PWD and 35.8% of the NDP reported using medication for smoking cessation. The most prevalent medication used by the PWD and the NDP was the nicotine patch (58.8% vs 48.1%).

Nearly 33% (32.8%) of the PWD and 39.5% of the NDP reported alcohol consumption. The mean numbers of drinks per day for the PWD was 8, and for the NDP it was 5 ($P<.01$) (Table 1). In terms of times in the past 30 days that they had consumed five or more drinks on one occasion, the mean number of times for the PWD and the NDP was 3. In addition, 28.9% of the PWD and 22.6% of the NDP reported driving in the past 30 days after consuming 3 or more alcoholic beverages; the mean number of times was 3 for both groups.

In the clinical interview, 95.7% of the PWD and 62.3% of the NDP reported having health conditions ($P<.01$). The mean number of health conditions in the PWD was 5 and for the NDP it was 3 ($P<.01$) (Table 1). However, health conditions reported by the PWD and the NDP with statistically significant differences were hypertension, circulatory problems, respiratory infections and migraine. More than half (53.2%) of the PWD and 30.5% of the NDP reported having hypertension ($P<.01$), 27.9% of the PWD and 15.9% of the NDP reported having circulatory problems ($P<.01$), 30.6% of the PWD and 20.6% of the NDP reported having respiratory infections ($P=.02$), 14.4% of the PWD and 23.9% of the NDP reported having migraine ($P=.03$) (Table 2). Finally, 60.4% of PWD and 61.3% of the NDP reported feeling depressed, but the symptom with a statistically significant difference was lack of interest in daily activities (45.9% of the PWD vs 57.5% of the NDP) ($P=.02$) (Table 2).

DISCUSSION

Smoking is an important modifiable risk factor for some complications in the PWD.[12] The combination effect of tobacco use and diabetes creates an urgent need for heightened awareness of and a renewed focus on smoking cessation.[13] Experts say that modifying smoking habits improves the prognosis for the PWD.[14] One year after quitting smoking, the risk of heart disease was reduced by half and after 15 years the risk equals that of a nonsmoker.[14] Among the general population, some research shows that medical counseling during a simple routine consultation increases the likelihood that the patient will stop smoking.[15–17] The American Diabetes Association noted that smoking cessation has not received the priority it deserves from health care providers and recommended that identification of smoking status and systematic cessation support should be incorporated into the routine practice of diabetes care.[7,18] The habit of smoking in PWD influences several factors that may increase insulin resistance and

Table 2. Categorical variables for PWD and NDP

	PWD (*N*= 116)		NDP (*N*= 948)					
	n	%	*n*	%	X^2	*P*	OR	95% CI
Variables:								
Menthol cigarettes					7.94[a]	.01	.57	.38, .85
Yes	44	37.9	491	51.8				
No	72	62.1	457	48.2				
Reasons for trying to quit smoking								
Improve their health	104	89.7	830	87.6	.43	.51	1.23	.66, 2.31
Health of their children	24	20.7	222	23.4	.43	.51	.85	.53, 1.37
They got tired of smoking	12	10.3	85	9.0	.24	.63	1.17	.62, 2.22
Family request	16	13.8	177	18.7	1.66	.20	.70	.40, 1.21
Bad smell	12	10.3	107	11.3	.09	.76	.91	.48, 1.70
Cigarette cost	36	31.0	252	26.6	1.04	.31	1.24	.82, 1.89
Physician recommendation	12	10.3	48	5.1	5.42	.02	2.16	1.11, 4.20
For a promise	3	2.6	8	.8	----	.11[b]	3.12	.82, 11.93
To get control of me	7	6.0	74	7.8	.46	.50	.76	.34, 1.69
Have health conditions					51.20	<.01	13.41	5.42, 33.17
Yes	111	95.7	591	62.3				
No	5	4.3	357	37.7				
Health conditions[a]								
Hypertension	59	53.2	180	30.5	21.44	<.01	2.59	1.72, 3.91
Asthma	38	34.2	194	32.8	.08	.77	1.07	.69, 1.63
Heart disease	16	14.4	66	11.2	.96	.33	1.34	.74, 2.41
Gastric ulcer	11	9.9	55	9.3	.04	.84	1.07	.54, 2.12
Chest pain	26	23.4	148	25.0	.13	.72	.92	.57, 1.48
Respiratory infections	34	30.6	122	20.6	5.39	.02	1.70	1.08, 2.66
Cancer	3	2.7	10	1.7	----	.44[b]	1.61	.44, 5.96
COPD	3	2.7	11	1.9	----	.47[b]	1.46	.40, 5.34
Circulatory problem	31	27.9	94	15.9	9.23	.02	2.05	1.28, 3.28
Osteoporosis	7	6.3	33	5.6	.09	.76	1.14	.49, 2.64
Chronic cough with expectoration	24	21.6	108	18.3	.69	.41	1.23	.75, 2.03
Emphysema	6	5.4	22	3.7	.69	.41	1.48	.58, 3.73
Bronchitis	10	9.0	35	5.9	1.48	.22	1.57	.76, 3.28
Migraine	16	14.4	141	23.9	4.80	.03	.54	.31, .94
Epilepsy	2	1.8	19	3.2	----	.56[b]	.55	.13, 2.41
Insomnia	41	36.9	224	37.9	.04	.85	.96	.63, 1.46
Symptoms								
Lack of interest in daily activities	51	45.9	340	57.5	5.08	.02	.63	.42, .94
Feeling depressed	67	60.4	362	61.3	.03	.86	.96	.64, 1.46

PWD, people with diabetes; NDP, non-diabetic people
[a] PWD (*n*= 111) NDP (*n*= 591).
[b] Value of the Fisher Exact Test.

interfere with insulin action.[19] For these reasons, it is important to develop a strategy to encourage physicians to provide smoking cessation advice in a systematic way.[19]

The PWD seem to find it more difficult to give up smoking than other people.[6,20] For this reason, the PWD who smoke are special clinical challenges and are likely to require more creative and consistent interventions and support.[7] The findings of this study establish the existence of important differences between the PWD and the NDP who called the PRQ during 2008. These differences demonstrate that the PWD need specialized support of smoking cessation in comparison with the NDP. Facts that prove this are the high probability of having a health condition and the mean number of health conditions shown by the PWD in comparison with the NDP. With this in mind, and considering the mortality and morbidity rates of smoking and diabetes, as well as hospitalization costs, the health system needs to develop intervention frameworks to deal with long-term smoking-associated problems.[1] Non-smoking should be recognized as an important part of diabetes management, and included in all diabetes managements and educational programs.[21] In the PWD, all efforts related to preventing the onset of smoking or quitting the same, are an important

The findings of this study establish the existence of important differences between the PWD and the NDP…these differences demonstrate that the PWD need specialized support of smoking cessation.

investment in terms of health, quality of life and in medical care costs.[22] For this reason, it's important that chronic disease programs may also link with tobacco control programs to influence policy and systems change.[23] In Puerto Rico, due to the success of the Quitline, the PR Tobacco Control Program, in collaboration with the PR Diabetes Prevention and Control Program, have implemented the Diabetes Telephone Virtual Coaching, which provides orientation for diabetes management for smokers registered in the Quitline.

Some of the findings of the present study are compatible with a previous study conducted by Ortiz et al, which describes the general population who called the PRQ between December 2004 to December 2005.[24] In our study, more than 83% of the PWD and the NDP reported smoking their first cigarette during the first half hour after awakening and in the Ortiz study, more than 83% of the PRQ callers reported the same behavior. More than 90% of the PWD and the NDP in the present study reported wanting to quit over the next 30 days after having called the PRQ; this finding is also consistent with the Ortiz study; 90% of the PRQ callers reported to have the same goal. In our study and in the Ortiz study, among the reasons for trying to quit smoking with the counseling of the PRQ, more than 80% of the PWD and the NDP mentioned to improve their health. In both studies, the most prevalent (>50%) obstacle that may interfere with the quitting process was withdrawal symptoms.

Finally, Quitline proved to be a cost efficient way to save lives, and to prevent the complications of some chronic conditions like diabetes. Quitline was effective providing evidence-based tobacco dependence treatment services at the population level.[25] In 2008, the clinical practice guideline update of the Public Health Service found that Quitline counseling was more than 1.5 times as effective as minimal interventions or self-help material.[25,26] The findings of this study demonstrate that the population of the PWD are a special challenge for the PRQ in terms of incorporating new strategies to meet the needs of this population in the quitting process. For this reason, it is important to maintain a continuous analysis of the population who access Quitline services to meet the needs of the different subgroups of the population, thereby increasing the chances of success in the smoking cessation process.

STRENGTHS AND LIMITATION

One strength of our study is the sample, which includes 94% of the PRQ participants, a Hispanic sample with the same origin, and that this is the first epidemiologic study in Puerto Rico that describes and compares the PWD and NDP smokers who access the PRQ services. The study had some limitations; the data was limited to participants of the PRQ services, and that the data was based on the proactive calls of smokers who were less likely than the general populace to under-report their smoking related information. Finally, the data collection is limited to a single time point (cross-sectional design). As a result, study findings can only be generalized to the PWD and the NDP who received the services of the PRQ, therefore, changes over time cannot be assessed.

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