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Differences in Smoking Behavior and Attitudes Among Puerto Rican, Dominican, and Non-Latino White Caregivers of Children With Asthma

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Abstract

Purpose—No studies have examined the differences in smoking attitudes and behavior between Dominicans (DRs) and Puerto Ricans (PRs). Identification of pretreatment differences is important for cultural adaptation of evidenced-based smoking cessation treatments.

Design—Secondary analysis.

Setting/Intervention—Three home visits for asthma education and smoking cessation.

Subjects—Caregivers who smoke and have a child with asthma: DRs (n = 30), PRs (n = 67), and non-Latino whites (n = 128; NLWs).

Measures—Baseline assessment of psychosocial variables.

Analyses—Controlled for age, education, and acculturation.

Results—Compared with DRs, PRs were more acculturated, more nicotine dependent, less motivated and confident to quit, and identified more pros of smoking (all $p < .05$). Compared with NLWs, PRs were less likely to be employed, smoked fewer cigarettes per day, and had lower education, greater depressed mood, greater pros and cons of smoking, less social support, and

higher child asthma morbidity (all $p < .05$). Compared with NLWs, DRs were less nicotine dependent, more confident to quit, and less likely to live with a smoker; reported greater cons of smoking and greater stress; and were more likely to have a household smoking ban (DRs 60% vs. NLWs 33.6%). Only 3.3% of DRs were precontemplators vs. 16.4% (PRs) and 10.9% (NLWs).

Conclusions—PRs appear to have more factors associated with risk of smoking treatment failure; DRs appear to have more protective factors. Examination of the role of these smoking attitudes as potential moderators and mediators of smoking behavior are needed to guide the cultural adaptation of evidenced-based treatments.

Keywords

Acculturation; Smoking Behavior; Latinos; Puerto Ricans; Dominicans; Hispanic Americans; Non-Latino Whites; Smoking Cessation; Medically Underserved; Prevention Research

PURPOSE

Latinos are the largest minority group in the United States, accounting for more than 14.8% of the U.S. population.¹ Because Latinos are from different countries, there is considerable heterogeneity between subgroups. The prevalence of smoking among Latinos overall is 15.8%, but Cubans have the highest rates of smoking (21.5%), followed by American-born Mexicans (20.1%), Puerto Ricans (PRs; 18.6%), Central and South Americans (12.8%), immigrant Mexicans (11.6%), and Dominicans (DRs; 10.7%).² Further, there are regional differences in smoking behavior among Latinos in the United States.^{3,4}

Few studies have examined smoking cessation among Latinos⁵⁻⁹ and none among Latino subgroups. The current study examined group differences in smoking attitudes among PRs and DRs living in the mainland United States, compared with each other and non-Latino whites (NLWs). Only one study has examined differences in smoking among Latino subgroups,³ but this study did not measure important psychologic correlates of smoking. Exploring differences between these two Latino subgroups and NLWs is important for determining whether smoking cessation interventions developed for the majority population are relevant to specific Latino subgroups.

We examined a comprehensive constellation of smoking attitudes and behaviors, including self-efficacy and motivation to quit, risk perception, social support, depressed mood, and perceived stress because these factors are associated with poor smoking cessation outcomes among the majority population.⁹⁻¹² Because PRs are U.S. citizens, have lived with more than 100 years of U.S. influence, and have adopted U.S. lifestyles,^{13,14} we hypothesized that they would be more highly acculturated than DRs and therefore express similar attitudes to NLWs regarding smoking. Specifically, we hypothesized that PRs and NLWs would have lower motivation and self-efficacy to quit smoking and greater levels of psychosocial distress and nicotine dependence, relative to DRs.

A secondary aim of this study was to examine differences in asthma functional morbidity between the children of these smokers. Asthma prevalence and morbidity is much higher

among Latinos than among other racial and ethnic groups,^{15–17} and smoking leads to both the development of asthma and exacerbation of existing asthma.¹⁸

Our sample was unique because it was composed of two Latino subgroups from the northeastern United States. The majority of research focuses on Latinos in the southwestern United States (predominately with Mexican-Americans^{19–21}), even though smoking rates are higher among northeastern Latinos.^{3,4} Identifying differences between DRs and PRs may have important implications for treatment development and provide guidance for the cultural adaptation of evidenced-based treatments.²²

METHODS

Procedure

Participants were 225 smokers (Table 1; 67 PRs, 30 DRs, and 128 NLWs). Eligibility criteria were age ≥ 18 years, have a child age <18 years, smoke ≥ 3 cigarettes per day for the past year and smoke >100 cigarettes over their lifetime, and not currently in smoking cessation treatment. Participants did not have to want to quit smoking and were recruited from clinics, a low-income health insurance plan, and Latino agencies and events. This was a secondary analysis using only baseline data from two similarly conducted randomized trials^{5,23} on asthma education and smoking cessation. Both studies received approval from our Human Subjects Review Board.

Measures

We measured demographics (Table 1), number of cigarettes smoked per day, nicotine dependence,^{24–26} age of smoking initiation, number of life-time quits ≥ 24 hours, use of nicotine patch, receipt of physician advice to quit, number of household smokers, presence/absence of household smoking bans, and stage of change (precontemplation: not thinking about quitting within 6 months; contemplation: planning to quit within 6 months; and preparation: planning to quit within 30 days.^{27–28} Acculturation was measured (among Latinos only) with the Short Acculturation Scale for Hispanics (12 items); higher scores indicate greater acculturation.²⁹

We assessed motivation to quit smoking with the contemplation ladder; higher scores indicate greater readiness.^{30,31} Self-efficacy to quit was assessed with a 1 to 10 scale⁸; higher scores indicate greater confidence. We measured the pros and cons of smoking with the Smoking Decisional Balance Scale²⁸; higher scores indicate greater pros or cons of smoking (20 items).

The Asthma Functional Severity Scale measured the child's asthma functional morbidity.³² Higher scores indicate greater symptoms and activity limitation owing to asthma. Perceived vulnerability to smoking-related disease was measured with three items ("If you continue to smoke, how likely is it that you will develop (a) lung cancer, (b) lung disease, and (c) heart disease"; seven-point scale each).³³ Perceived health was measured with a five-point scale (1 = excellent, 5 = poor).

Depressed mood was measured with the 20-item Center for Epidemiologic Studies Depression Scale³⁴; higher scores represent greater depressed mood. The Abbreviated Hassles Index³⁵ measured stressful environments (e.g., living in an unsafe neighborhood); higher scores suggest greater perceived stress. Social support was assessed with the Interpersonal Support Evaluation List (16 items); higher scores reflect greater perceived support.³⁶

Data Analysis

We examined differences among NLWs, PRs, and DRs using analyses of variance and χ^2 . We then compared NLWs with DRs, and NLWs with PRs, using analyses of covariance for continuous variables and logistic regression for categorical variables, controlling for significant group differences (e.g., age and education). Separate analyses were conducted controlling for acculturation in DRs and PRs to examine ethnic group differences independent of the effect of acculturation on smoking behavior and attitudes.

RESULTS

Demographics

Compared with NLWs, fewer PRs were employed (24.6% vs. 45.3%; $\chi^2[1] = 7.8$; $p = .005$), had a high school diploma (18.2% vs. 38.3%; $\chi^2[1] = 8.2$; $p = .004$), and completed more than a high school education (21.2% vs. 36.7%; $\chi^2[1] = 4.9$; $p = .028$). DRs were older than both NLWs ($p = .0001$) and PRs ($p = .001$; $F(2,222) = 12.0$; $p = .0001$), and a greater proportion of DRs received no more than an eighth grade education vs. NLWs (23.3% vs. 4.7%; $\chi^2[1] = 11.2$; $p = .001$). PRs reported greater levels of acculturation (mean, 29.6 vs. 22.6; $t(88) = 3.22$; $p = .002$) compared with DRs. More PRs were born in the mainland United States vs. DRs (96.7% vs. 74.6%; $\chi^2[1] = 6.7$; $p = .01$).

Smoking History and Attitudes

DRs had lower nicotine dependence than both NLWs ($F(2,215) = 6.60$; $p = .002$) and PRs ($F(1,83) = 8.3$; $p = .005$). Fewer DRs lived with another smoker vs. NLWs (13.3% vs. 46.5%; $p = .023$). PRs were less motivated to quit smoking than DRs ($F(1,87) = 6.53$; $p = .012$). DRs had greater self-efficacy ($p < .0001$) to quit smoking than both NLWs ($F(2,218) = 9.4$; $p < .0001$) and PRs ($F(1,87) = 5.80$; $p = .018$). PRs reported more pros of smoking than both DRs ($F(1,82) = 6.4$; $p = .014$) and NLWs ($p = .02$). Both PRs ($p = .035$) and DRs ($p = .003$) reported more cons of smoking than NLWs ($F(2,219) = 7.1$; $p = .001$). DRs had the highest proportion of households with a smoking ban, significantly greater than NLWs (60% vs. 33.6%; odds ratio = 3.62; 95% confidence intervals, 1.42–9.24; $p = .007$).

A greater proportion of PRs were in the precontemplation stage (16.4%) than DRs (3.3%) and NLWs (10.4%), and the difference between NLWs and DRs nearly reached significance ($\chi^2[1] = 3.3$; $p = .07$; Table 1).

Psychosocial Variables and Health

Children of PRs had greater asthma functional morbidity ($p < .05$) compared with children of NLWs ($F(2,204) = 3.4$; $p = .035$). PRs reported greater depressed mood ($F(2,218) = 3.4$; p

= .037) vs. NLWs ($p = .04$) and lower social support ($F[2,217] = 4.9$; $p = .008$) vs. NLWs ($p = .017$). DRs reported significantly greater daily hassles ($F[2,218] = 5.6$; $p = .004$) vs. NLWs ($p = .004$).

DISCUSSION

We found important differences between DRs and PRs compared with each other and with NLWs. Because DRs and PRs differ from NLWs on pretreatment factors previously shown to be associated with poor smoking cessation outcomes, it is less likely that evidenced-based treatments effective for the majority culture will be equally effective for Latinos,^{5,22,37} suggesting the need for cultural adaptation of treatments for Latinos. There were also important pretreatment differences between PRs and DRs (e.g., motivation to quit, nicotine dependence, pros of smoking, stage of change), suggesting that cultural adaptation of treatments may be compromised by not accounting for within-group heterogeneity. Although it may not be feasible to have numerous treatments for different subgroups,^{22,37} our results identified meaningful differences between subgroups that could be used in treatment tailoring. For example, of the three groups, DRs had the most protective factors (factors associated with quitting) and the least number of risk factors (factors associated with smoking treatment failure). Stress was the only risk factor reported by DRs, suggesting that treatment include stress management. PRs had low motivation to quit and greater risks for continued smoking; therefore, more motivationally based and intensive strategies may be needed.

DRs had many protective factors to facilitate quitting (low acculturation, low nicotine dependence, high motivation and self-efficacy to quit smoking, fewer pros of smoking, and more cons of smoking). Only 13.3% of DRs lived with another smoker, and a high proportion had a household smoking ban (60%). Only 3.3% of DRs were in the precontemplation stage vs. 16.4% of PRs and 10.9% of NLWs. The consistent pattern of results suggested that DRs may have less difficulty quitting smoking, although direct tests of this hypothesis are warranted.

In contrast, PRs had only one protective factor for smoking cessation (fewer cigarettes per day) and the greatest number of risk factors for smoking treatment failure (higher unemployment and acculturation, lower motivation and self-efficacy to quit smoking, more pros of smoking, greater depressed mood, and lower social support). A greater percentage of PRs were in precontemplation, indicating that strategies may be needed to motivate their treatment entry. Once in treatment, the social context of PRs should be taken into consideration because more than one-third lived with another smoker and only 55.2% had a household smoking ban. These risk factors among PRs are particularly important given their high level of asthma functional morbidity.¹⁸

Our data should be viewed with caution because of multiple statistical tests. However, our study was exploratory, and we wanted to minimize the risk of type 2 error. This approach is supported by Rothman³⁸ and has been used in other research.^{7,39} In addition, our analyses were hypothesis driven; therefore, there is less capitalization on chance. Also, although a very high proportion of Latinos have children with asthma,¹⁷ our findings may not be

generalizable to Latinos who do not have children with asthma or to Latinos in other parts of the United States. However, given that the majority of smoking research has been conducted with Latinos in the Southwest,^{19–21} our focus on Latinos in the Northeast could be viewed as a strength.

Culturally adapted smoking cessation interventions outperform clinical guidelines among Latino smokers.⁵ Borrelli²² outlined eight criteria to justify cultural adaptation of evidenced-based treatments for smoking cessation. Although our study did not assess all eight factors, our results show that two factors (i.e., risk and protective factors) differentiated the groups. Despite continued attention to disparities in health care, minority groups experience more negative health outcomes relative to majority groups.¹⁸ The 2010 Census is expected to reveal increased cultural diversity in the United States, calling for increased attention to the cultural relevance of our treatments.

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Table 1
 Baseline Differences Among DRs, PRs, and NLWs on Demographics, Acculturation, and Stage of Change*

Variable	NLWs (SD) (n = 128)	PRs (SD) (n = 67)	DRs (SD) (n = 30)	p for NLWs vs. PRs	p for NLWs vs. DRs	p for PRs vs. DRs
Gender, % women	88.3%	77.6%	83.3%	ns	ns	ns
Age, y	33.1 (8.6)	34.9 (9.3)	42.0 (10.1)	ns	0.001	0.001
Education						
Grade 8	4.7%	10.6%	23.3%	ns	0.001	ns
Grade 9–11	20.3%	50.0%	36.7%	0.000	ns	ns
High school or GED	38.3%	18.2%	16.7%	0.004	ns	ns
>High school	36.7%	21.2%	23.3%	0.028	ns	ns
% Employed	45.3%	24.6%	40.0%	0.005	ns	ns
% Married or partnered	43.8%	36.4%	36.7%	ns	ns	ns
Acculturation [†]						
Number of years in United States	NA	16.4 (12.8)	17.3 (6.9)	—	—	ns
Acculturation score (12–60)	NA	29.6 (10.5)	22.6 (7.0)	—	—	0.002
% Not born in mainland United States	NA	74.6%	96.7%	—	—	0.01
Stage of change						
Precontemplation	10.9%	16.4%	3.3%	ns	ns	0.07
Contemplation	50.0%	41.8%	53.3%	ns	ns	ns
Preparation	39.1%	41.8%	43.3%	ns	ns	ns

DRs indicates Dominicans; GED, general equivalency diploma; NLWs, non-Latino whites; NA, not applicable; ns, not significant at $p < 0.05$; and PRs, Puerto Ricans.

* Analyses of variance were used for the analysis of continuous variables and χ^2 for categorical variables. Bold p values are statistically significant.

[†]These questions were not asked of NLWs; acculturation was not a hypothesis in the study from which the NLWs were drawn.

Table 2

Baseline Differences Among DRs, PRs, and NLWs on Smoking History, Attitudes, and Beliefs*

Variables	NLWs, mean (SD) (n = 128)	PRs, mean (SD) (n = 67)	DRs, mean (SD) (n = 30)	<i>p</i> [†] NLWs vs. PRs	<i>p</i> [†] NLWs vs. DRs	<i>p</i> [‡] PRs vs. DRs
Smoking history						
Cigarettes per day	16.8 (8.7)	12.11 (8.9)	9.4 (7.7)	0.001	0.000	0.090
Nicotine dependence (0–10)	4.7 (1.4)	4.6 (2.5)	3.3 (1.7)	ns	0.002	0.005
Age started to smoke, y	15.5 (4.5)	16.8 (5.8)	17.6 (5.4)	ns	ns	ns
Number of lifetime quit attempts	4.4 (7.1)	3.6 (6.2)	2.9 (3.6)	ns	ns	ns
% Used nicotine patches to quit	29.0	20.0	27.0	ns	ns	ns
% Had doctor advise to quit smoking	85.9	77.6	80.0	ns	ns	ns
% Live with another smoker	46.5	35.8	13.3	ns	0.02	0.058
Smoking attitudes and beliefs						
Contemplation ladder (1–10)	7.7 (2.3)	6.9 (3.1)	8.7 (2.2)	0.090	ns	0.012
Confidence to quit (1–10)	5.4 (2.5)	6.4 (3.1)	8.1 (3.0)	ns	0.002	0.018
Pros of smoking (10–50)	23.9 (7.9)	27.5 (8.8)	23.5 (6.3)	0.014	ns	0.014
Cons of smoking (10–50)	36.8 (7.1)	39.4 (6.1)	42.1 (4.7)	0.035	0.003	0.075
Health and risk perception						
Child's asthma morbidity (0–4)	1.15 (0.93)	1.62 (1.0)	1.2 (1.1)	0.051	ns	ns
Perceived health (1–5)	2.9 (.81)	2.99 (1.1)	3.1 (1.25)	ns	ns	ns
Self-perceived vulnerability (3–21)	16.5 (3.3)	15.4 (4.2)	16.1 (3.5)	ns	ns	ns
Psychosocial variables						
Depressed mood (CES-D; 0–60)	17.2 (12.1)	22.3 (11.9)	20.9 (12.3)	0.041	ns	ns
Daily hassles (0–9)	3.2 (2.2)	3.7 (2.3)	4.5 (2.4)	ns	0.004	ns
Social support (ISEL; 16–64)	49.5 (8.6)	45.8 (7.3)	46.3 (6.5)	0.017	0.099	ns
% With household smoking ban	33.6	44.8	60.0	0.06	0.007	ns

CES-D indicates Center for Epidemiologic Studies Depression Scale; DRs, Dominicans; ISEL, Interpersonal Support Evaluation List; NLWs, non-Latino whites; and PRs, Puerto Ricans.

* Means, SD, and percentages shown are unadjusted. Bold *p* values are statistically significant.

[†]Models controlled for age and education.

[‡]Models controlled for acculturation.