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## Depressive Symptoms and Cigarette Smoking among Latinos in San Francisco

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**Abstract:** We administered the Center for Epidemiological Studies Depression (CES-D) Scale to 547 San Francisco Latinos as part of a random digit dialing telephone survey to evaluate smoking behavior. Both men and women current smokers had the highest mean CES-D levels (9.7 and 14.3, respectively). Logistic regression analysis adjusting for gender, acculturation, education, age, and employment showed that current smokers had an odds ratio of 1.7 (95% CI = 1.3, 2.2) for significant depressive symptoms compared to former smokers (OR = 1.1; 95% CI = .8, 1.6) and never smokers (OR = 1). (*Am J Public Health* 1990; 80:1500-1502.)

### Introduction

Cigarette smoking continues to be the most common cause of preventable morbidity and mortality in the US.<sup>1</sup> Three community studies<sup>2-4</sup> and a study of adolescents<sup>5</sup> have reported on possible relations between smoking status and depressive symptoms with conflicting results.

Five population-based surveys of Latino communities in California have reported a high rate of depressive symptoms compared to non-Latino White samples.<sup>6-11</sup> Female gender,<sup>6,8,9</sup> younger age,<sup>6,9</sup> formerly married status,<sup>9-11</sup> lower income,<sup>6,10,11</sup> less education,<sup>9,10</sup> unemployment,<sup>11</sup> and inability to speak English<sup>9</sup> have been associated with a higher level of depressive symptoms. Factors associated with increased depressive symptoms in the Hispanic Health and Nutrition Examination Survey were female gender, low educational achievement, low income, and US birth combined with Anglo-oriented acculturation.<sup>12</sup> To date, no study has examined smoking status as it relates to depressive symptoms among Latinos.

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Although the overall prevalence of cigarette smoking among US Latinos is somewhat lower than that for Whites or Blacks, this rate reflects the substantially lower smoking proportions of Latino women compared to men.<sup>13-15</sup> Increasing acculturation to the mainstream US culture results in more smoking by Latino women, but less among Latino men, and thus may eventually narrow this smoking gender gap.<sup>15</sup>

We examined the possible relation of depressive symptoms, cigarette smoking status, and demographic variables, within a community survey of Latinos in San Francisco, part of an ongoing evaluation of a community intervention to promote smoking cessation.

### Methods

Subjects were sampled from the 27 census tracts in San Francisco with at least 10 percent Latinos and representing two-thirds (N = 55,541) of all Latinos (N = 83,373) living in San Francisco according to the 1980 US Census.<sup>16</sup> Telephone prefixes corresponding to the census tracts were identified using a reverse telephone directory and the Mitofsky-Waksberg<sup>17</sup> method for random digit dialing was applied.<sup>18</sup> This method identifies nonworking and other ineligible prefixes in a first stage.

A household was eligible if, on the initial question, the person answering the telephone self-identified as Latino or if the majority of residents were Latino. Within a given household, the Latino adult between 18 and 65 years of age who had most recently celebrated a birthday was invited to respond. A structured questionnaire was administered anonymously by trained bilingual interviewers after subjects gave verbal consent. Participants responded in Spanish (69.7 percent) or in English (30.3 percent); 5.5 percent of eligible participants refused to be interviewed.

Depressive symptoms were measured using the Center for Epidemiological Studies Depression scale (CES-D)<sup>19</sup> which has been applied in Spanish in other studies with Latinos.<sup>6-8,11</sup> A CES-D score of 16 or more is considered to represent significant depressive symptoms, and validation studies with psychiatric and community samples showed that approximately one-third of persons scoring 16 or more on the CES-D are diagnosed with clinical depression.<sup>20,21</sup>

Never smokers were defined as persons who had smoked less than 100 cigarettes in their entire life. Gender, age,

education, employment in last two weeks, birthplace, and national background were asked, but marital status was not determined. A five-item acculturation scale with excellent reliability and validity was administered and scores were dichotomized into low (1 to <3) and high ( $\geq 3$  to 5) acculturation groups.<sup>22</sup>

Data were analyzed using a standard statistical software package for a microcomputer (BMDP).<sup>23</sup> Variables that have been shown in previous research to be associated with depression were entered into a logistic regression model along with smoking status: acculturation (low/high), age (<30 /  $\geq 30$  years), employment status (yes/no), and education (<12 years /  $\geq 12$  years). The categorical variable smoking status was coded into two variables: current smoking (yes/no) and former smoking (yes/no).

### Results

A total of 604 Latinos agreed to be interviewed by telephone between June and August 1988; 57 (9.4 percent) were excluded from this analysis because of incomplete information; their demographic characteristics and smoking status were similar to those completing the CES-D and acculturation scales for gender, age, acculturation, birthplace, education, and smoking status, but they were more likely to be unemployed. The 547 subjects completing the CES-D had a mean age of 35 years (SD = 12), 11 years (SD = 4.1) of education, and 59 percent were women. The mean duration of time living in the US for the foreign-born was 12.4 years (SD = 9.5) and the mean acculturation score for the entire sample was 2.4 (SD = 1.2). Overall smoking prevalence age-adjusted by the direct method<sup>24</sup> to the 1980 US Census<sup>16</sup> was 19 percent, with more men (29 percent) smoking than women (13 percent).

The overall mean level of depressive symptoms was 9.4 (95% CI = 8.6, 10.2), and 104 (19 percent) subjects scored 16 or greater on the CES-D. Table 1 shows the mean CES-D

scores separately for men and women by demographic characteristics. Women reported a higher mean level of depressive symptoms than men for each category analyzed. Unemployment and less than high school education were also associated with a greater risk of depressive symptoms. Never smokers reported a lower mean level of depressive symptoms than current smokers or former smokers. The proportion of current smokers with a mean CES-D score  $\geq 16$  was 21.9 percent for men and 39.5 percent for women, compared to 11.8 percent and 18.5 percent, respectively, for never smokers.

The odds ratio (OR) of significant depressive symptoms (CES-D  $\geq 16$ ) by smoking status was evaluated using logistic regression analysis controlling for gender, acculturation, education, age, and employment status. Results, shown in Table 2, indicate that overall current smokers have a 70 percent greater risk of significant depressive symptoms than never smokers. The increased risk was present for both men and women. Former smokers do not have an increased overall risk of significant depressive symptoms although for women the risk is greater than for men.

### Discussion

Among Latinos in San Francisco, current smokers have a modest increased risk of reporting significant depressive symptoms on the CES-D when compared to never smokers. Although unemployment and less years of education were associated with more depressive symptoms in this study, their effects were marginal compared to that of gender and smoking status. Marital status, social support and self-reported health status, which have been found to correlate with depressive symptoms in some studies,<sup>9-11</sup> were not determined as part of this survey and it is possible that these variables may partly account for our results.

Studies of personality profiles of smokers have generally found that smokers are more extroverted and that a modest

TABLE 1—Mean Depressive Symptoms by Demographic Variables among San Francisco Latinos

	Men			Women		
	N*	CES-D	% $\geq 16$	N	CES-D	% $\geq 16$
Total	225	8.0	14.2	322	10.4	22.4
Age (years)						
18-29	96	8.1	13.5	117	10.2	22.2
30-65	129	7.9	14.7	204	10.4	22.5
Acculturation score						
low	146	8.4	15.1	226	10.5	22.6
high	79	7.2	12.7	96	10.1	21.9
Birthplace						
Latin America	172	8.0	14.5	234	10.3	21.4
United States	52	8.2	13.5	87	10.5	25.3
National background						
Mexican American	86	8.2	16.3	92	11.1	25.0
Central American	109	8.0	12.8	183	9.6	20.0
Other Latinos	30	7.3	13.3	41	11.9	26.8
Employed last 2 weeks?						
yes	165	7.4	12.1	183	10.0	20.2
no	57	9.8	21.1	138	10.9	25.4
Education (years)						
0-11	73	9.3	19.2	136	11.9	26.5
$\geq 12$	150	7.3	12.0	183	9.3	19.7
Smoking status						
never	110	6.9	11.8	242	9.3	18.5
former	51	8.2	9.8	37	12.9	27.0
current	64	9.7	21.9	43	14.3	39.5

\*Ns may not add up to total because of missing data.

**TABLE 2—Adjusted\* Odds Ratio of Significant Depressive Symptoms by Cigarette Smoking Status among San Francisco Latinos<sup>†</sup>**

	Sample OR (95% CI) <sup>‡</sup>	Men OR (95% CI)	Women OR (95% CI)
Never smokers*	1.0	1.0	1.0
Former smokers	1.1 (.8,1.6)	.8 (.5,1.5)	1.3 (.9,2.0)
Current smokers	1.7 (1.3,2.2)	1.4 (.9,2.2)	1.8 (1.2,2.5)

\*Estimates were adjusted for acculturation level, education, age, and employment status. Estimates for the entire sample were also adjusted for gender.

<sup>†</sup> Significant depressive symptoms are defined as a CES-D score  $\geq 16$  (see text).

\* Never smokers were the reference group.

relationship exists between smoking and neuroticism.<sup>25</sup> The few specific studies on smoking and depression have found contradictory results. In a survey of 1,003 adults living in Los Angeles in 1979, Frerichs and colleagues<sup>2</sup> also found a significantly higher level of depressive symptoms as measured by the CES-D among smokers compared to nonsmokers (10.02 vs 8.76). In a study of 2,018 British men evaluated with a scale for psychoneurotic profile, Haines, *et al.*,<sup>3</sup> also found that scores on the depression subscale (and the other four) were higher for smokers than nonsmokers. However, in both the above mentioned studies, when confounding factors were controlled the association of smoking and depression was no longer significant. A community survey of 1,209 men and women in New Zealand, using a scale similar to the British study, did find that depression was significantly greater among heavy smokers when compared to never smokers even when controlling for confounding factors.<sup>4</sup> Finally, a sample of 50 patients undergoing elective cardiac catheterization in St. Louis were evaluated for clinical depression and cigarette smoking was the only predictor variable associated with a diagnosis of depression.<sup>26</sup>

Although the causality between feeling depressed and smoking cannot be assumed from these cross-sectional data, recent prospective studies support such a link. Depressed adolescents 15 to 16 years of age in New York public schools were found to be more likely to be heavy cigarette smokers than non-depressed adolescents at ages 24 to 25 years.<sup>5</sup> Other suggestive evidence is from a clinical trial of clonidine as a pharmacologic adjunct to smoking cessation in 71 heavy smokers, which showed that 61 percent had a history of major depression and that this history had a significant negative effect on cessation regardless of treatment.<sup>27</sup>

It is possible that smokers report more depressive symptoms than nonsmokers because they are more willing to admit negative characteristics about themselves. As smoking becomes a less socially acceptable behavior smokers may become more depressed as a consequence, thus confounding the association observed in this study. However, if these findings are confirmed in other studies, smoking cessation interventions may need to integrate depression prevention and treatment components to maximize effectiveness.

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