

Smoking and Depression: A Community Survey

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Abstract: Smoking status and symptoms of mental depression were determined as part of a community survey of adults in Los Angeles County. Nearly 42 per cent of the males and 31 per cent of the females were current smokers. Smokers compared to nonsmokers reported significantly higher levels of depression as measured by the Center for Epidemiologic Studies—Depression (CES-D) index (10.02 vs 8.76, $p < .05$). The differences were not significant, however, when analyzed by sex. Furthermore, there were no significant differences in the CES-D score when comparing those who had never smoked, ex-smokers, current smokers who wanted to quit, and current smokers who did not want to quit. After controlling in a linear regression analysis for the effects of income, age, employment status, and sex, none of the smoking status variables contributed significantly to explaining the variance of the CES-D score. While both mental depression and smoking are individually major public health problems, the results of this investigation suggest that there is little relationship between the two in the general community. (*Am J Public Health* 1981; 71:637–640.)

Introduction

While considerable attention has been focused on the physical disease consequences of smoking,¹ uncertainty still exists as to the mental health status of smokers. Some studies of personality and smoking have found smokers to exhibit slightly poorer mental health than nonsmokers,^{2, 3} while others have demonstrated no relationship.^{4, 5} Furthermore, sex differences may exist: one study reports a slight though positive association between neuroticism and smoking in females, but no association in males.⁶

The present investigation is based on a cross-sectional survey of adults in Los Angeles County, California to determine the reasons for, and consequences of, mental depression in the community. Other results of the community-based investigation are presented elsewhere.^{7*}

We have several reasons for believing that smoking may be associated with depression. First, the negative image of smoking behavior developed by the media and the public

health community may contribute to a negative self-image among smokers. Since a negative attitude toward oneself is a component of depression, such individuals may be at higher risk for developing depression. We would expect to find such an effect most pronounced among those who desire to quit smoking but who have been unable to do so; in addition to experiencing a negative image of the self, such individuals may experience the sense of failure and helplessness often associated with depression. Second, smoking in the face of the medical information about its negative health effects can be construed as self-destructive behavior, also in keeping with negative self-image and guilt associated with depression. It may be that the same underlying personality dimensions that cause a person to engage in smoking behavior may also put the person at risk for developing depression. On the other hand, individuals who have quit smoking have had a successful experience in giving up an addictive habit and may derive therefrom a sense of control that is counter to developing depression. Possibly the same underlying personality elements that enable a person to quit smoking may also make that person less vulnerable to developing depression. For these reasons, we expect that smokers are more depressed than nonsmokers, and that those persons who have quit smoking are less depressed than smokers who wish to quit but have been unable to do so.

Methods

As part of the ongoing Los Angeles Metropolitan Area Sample (LAMAS), adult residents of a representative sample of eligible households in Los Angeles County were selected to participate in the first phase of a prospective study of the epidemiology of depression and help-seeking behavior. One resident adult per household was selected for an interview during May–September 1979. Of the 1,531 eligible households, 1,003 (66 per cent) consented to participate, 365 (24 per cent) refused, and 163 (11 per cent) were designated inaccessible due to security systems of their buildings, language barriers (neither English nor Spanish spoken), incapability of response, or nonresponse after three callbacks. The interview was administered in either English ($N = 887$) or Spanish ($N = 116$) by professional interviewers from the University of California at Los Angeles (UCLA) Institute for Social Science Research.

In addition to a wide range of topics described elsewhere,^{7*} the interview solicited information on smoking

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*Aneshensel CS, Frerichs RR, Clark VA: Family roles and sex differences in depression. (Submitted for publication).

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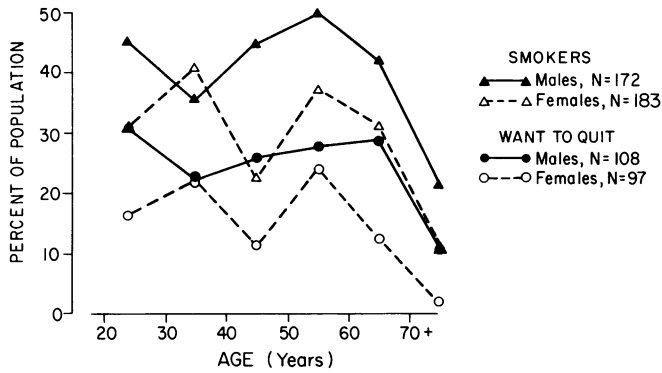


FIGURE 1—Occurrence of Smokers and Persons Who Want to Stop Smoking by Age and Sex, Los Angeles, 1979

behavior and on the 20 symptoms of depression experienced during the prior seven days that comprise the Center for Epidemiologic Studies-Depression (CES-D) index. A complete description of this index and validation studies with clinical populations have been published elsewhere.^{8, 9} The score derived from the index is a measure of depressive symptomatology, the mean levels of which have been published for Los Angeles,⁷ for communities in Kansas and Maryland,¹⁰ and for a representative sample of the United States population.¹¹

The null hypotheses of equal mean scores on the depression index by type of smoker or nonsmoker for both males and females, and for males and females separately, were tested using the natural logarithm of the depression score plus one as the dependent variable. The depression index is highly skewed toward the right for free-living populations and the transformation using the logarithm reduces this skewness. The data cannot be made normally distributed by a transformation because the modal value is zero. The actual CES-D means are reported, however, to simplify comparison with the results of other investigations. The mean scores for the transformed data were analyzed using the Statistical Analysis System (SAS) general linear models procedure, with sex and category of smoking the independent variables, and F tests were performed.¹²

The regression results were computed using the Statistical Package for the Social Sciences (SPSS) stepwise regres-

sion program with dummy coding (0, 1) for the smoking categories and the employed and not employed.¹³ The four categories of smoking behavior (smokers, smokers who quit, smokers who want to quit, and smokers who do not want to quit) were coded as smokers vs all others, smokers who quit vs all others, and smokers who want to quit vs all others. Thus, the smokers who do not want to quit became the reference category and control group in the regression analysis.¹³

Results

The occurrence of smoking behavior by sex is illustrated in Figure 1. Nearly 42 per cent of adult males and 31 per cent of adult females in our population were currently smokers. The smoking rates among males exceeded those of females in every age group with the exception of those aged 30–39 years. Furthermore, the percentage of smokers in the population who expressed a desire to quit was consistently greater at every age interval among males than females (Figure 1). Almost 63 per cent of the males who smoked stated that they would like to quit, as compared to 53 per cent of the females who smoked.

Smokers reported a significantly higher depression score than nonsmokers (CES-D, 10.02 vs 8.76, $p < .05$). While the excess score of smokers was apparent for each sex, the differences were not statistically significant among either males (8.25 vs 7.20, $p = .14$) or females (11.67 vs. 9.69, $p = .08$). The smokers were further categorized according to the average number of cigarettes smoked per day. When comparing those smoking less than a pack, a pack, and greater than a pack per day, there were no significant differences in depression score among the three levels of cigarette consumption (10.37 vs 8.95 vs 10.57; $p = .32$).

The population was further categorized into four groups according to whether or not they had ever smoked, had quit smoking, were currently smoking and did not want to quit, and were currently smoking but did want to quit. We postulated that ex-smokers would feel in control of their lives and report the lowest level of depression, the never-smoked and smoker who did not wish to quit would report a slightly higher level of depression, while those who wanted

TABLE 1—Mean Depression Score by Sex and Smoking Status

Smoking Habit	CES-D Score					
	Total		Males		Females	
	N	\bar{X}	N	\bar{X}	N	\bar{X}
Nonsmoker						
Never smoked	454	8.99	143	7.57	311	9.64*
Ex-smoker	190	8.22	97	6.65	93	9.86
Smoker						
Do not want to quit	150	9.56	64	8.02	86	10.69
Want to quit	205	10.36	108	8.39	97	12.55*

*Significant sex difference, $p < .05$ [F test; $1n (CES-D + 1.0)$]; no significant smoking habit differences in the total population or within each sex.

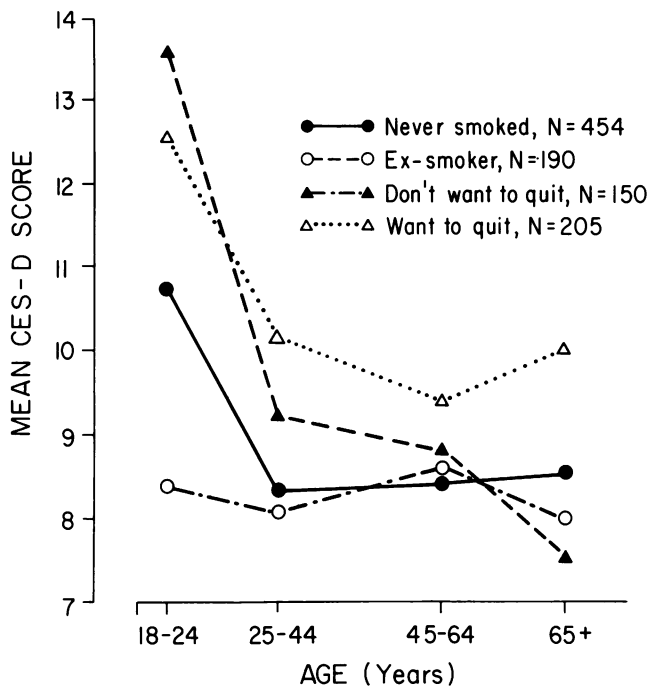


FIGURE 2—Mean Depression Score (CES-D) by Smoking Status and Age, Los Angeles, 1979

to quit but could not would report the highest level of depression. As shown in Table 1, those smokers who want to quit have the highest depression scores, followed by smokers who do not want to quit, and nonsmokers. These differences were not statistically significant either for the total population or within each sex. The relationship of the four smoking categories—never smoked, ex-smoker, want to quit, and do not want to quit—to depression by age is shown in Figure 2. While those who wanted to quit smoking tended to report the highest depression score, the differences among the four categories were not statistically significant ($F = 1.91, p = .13$). These differences remained nonsignificant ($F = 1.60, p = .19$) after controlling for the effects of age and smoking-age interactions.

We further hypothesized that the depression score would be higher among smokers who tried to quit many

times—since they would constantly be reminded of their inability to control their habit—as compared to those who tried to quit once or twice or those who never tried to quit at all. As presented in Table 2, there were no significant differences among the three groups of smokers, for the total population or separately, when analyzed by sex.

As a final analysis, we included four demographic and socioeconomic variables, previously shown to be associated with the CES-D score,⁷ in a linear regression model with never-smoked, ex-smoker, and want to quit smoking included as dummy variables. After controlling for the effects of income, age, employment status, and sex, none of the smoking variables contributed significantly to explaining the variance of the CES-D score.

Discussion

Both the levels of smoking behavior and depression observed in Los Angeles are similar to comparable observations in a representative sample of the adult United States population;^{1, 11} this suggests, therefore, that our results are applicable to other populations. The percentage of current smokers in Los Angeles during 1979 as compared to the United States in 1975 was slightly greater among males (42 per cent vs 39 per cent), but somewhat lower among females (31 per cent vs 33 per cent). On the other hand, the occurrence of ex-smokers was lower in Los Angeles males (24 per cent vs 29 per cent), but slightly higher among Los Angeles females (16 per cent vs 14 per cent). Mean levels of depression as measured by the CES-D index were slightly greater in Los Angeles ($\bar{X} = 9.2$) than in the United States as a whole ($\bar{X} = 8.7$).^{7, 11}

The findings of our investigation do not allow us to reject the hypothesis that smokers differ from nonsmokers with respect to depressive symptomatology. The results of more intensive analyses, including sex, age, and a finer distinction among smoking categories, were consistent with the predicted associations but not statistically significant. While those smokers who had tried unsuccessfully to quit tended to be slightly more depressed than the remainder of the population, the observed differences could well have been due to chance. If smoking cessation is associated with

TABLE 2—Mean Depression Score by Sex among Smokers Who Have Attempted to Quit

Smokers	CES-D Score					
	Total		Males		Females	
	N†	\bar{X}	N	\bar{X}	N	\bar{X}
Never attempted to quit	120	9.65	57	7.32	63	11.76*
Tried to quit						
1–2 times	127	10.10	64	8.89	63	11.33
≥3 times	104	10.61	50	8.50	54	12.56

*Significant sex difference, $p < .05$ [F-test; $1n(\text{CES-D} + 1.0)$]; no significant smoking category differences in the total population or within each sex.

†Missing data on 1 male and 3 females.

depression, however, these effects may be stronger at the time when success or failure occurs.

Our findings are in general agreement with those recently reported by Haines, *et al*, who measured depression among 2,018 British men using a different scale than the one we employed.³ They found that depression scores were higher among smokers than nonsmokers, but that once the confounding effects of age and class were controlled in the analysis, the differences were no longer statistically significant. Conversely, the same depression scale used in the British study was employed in a community study in New Zealand which reported that depression was significantly related to smoking behavior in both males and females even after controlling for age and for a measure of obesity.¹⁴

Leon and her associates also reported that smokers were more depressed than nonsmokers, with results based on the depression subscale of the Minnesota Multiphasic Personality Inventory (MMPI).¹⁵ The study subjects, however, were not derived from a sample of the community but rather from a sample of convenience. Consequently, it is difficult to assess the extent to which differences in results derive from the different types of samples.

In a recent study of persons participating in a smoking withdrawal clinic, West, *et al*,¹⁶ reported that those who managed to stop smoking were emotionally more stable ($p < .01$) than those who continued to smoke. While our findings that ex-smokers have lower depression scores than smokers are in general agreement with these observations, our results were not statistically significant. Furthermore, ex-smokers may comprise not only those who quit voluntarily, but those who were encouraged to quit for serious medical reasons, a factor that may promote rather than reduce depression.

Both mental depression and smoking are, individually, major public health problems in the United States and elsewhere. The results of our cross-sectional study suggest that there is no association of practical importance between the occurrence of depression and smoking behavior in the general community, although we are unable to determine if a change in smoking behavior is associated with depression.

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