

# Depressive Mood, the Single-Parent Home, and Adolescent Cigarette Smoking

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**Abstract:** The association between depressive mood and cigarette smoking among adolescents was examined within a multivariate model. Subjects were 205 eleventh graders (123 boys and 82 girls) enrolled in a Northeast metropolitan public high school for science-oriented students. Logistic regression analysis showed an indepen-

dent relation of depressive mood, friends' smoking behavior, and living in a single-parent home with cigarette smoking. Depression scores correlated with the number of cigarettes smoked. These associations suggest that depressive mood and stress may contribute to the onset of smoking. (*Am J Public Health* 1990; 80:1330-1333.)

## Introduction

A host of factors have been investigated in numerous attempts to determine the antecedents of cigarette smoking among adolescents. Peer and family smoking behavior have been consistently implicated<sup>1-3</sup>; while less evidence has been demonstrated for the effects of psychological traits, knowledge and attitudes about smoking, school achievement, and demographic characteristics.<sup>1</sup>

A prospective study involving 1,004 subjects found that depressive symptoms reported at ages 15-16 predicted the frequency and duration of cigarette smoking nine years later.<sup>4</sup> This association was not seen for future alcohol or drug use. Another study found higher scores on the Beck Depression Inventory among cigarette smokers than in nonsmokers in males.<sup>5</sup> Both studies limited analysis to simple associations; neither controlled for the effect of other known risk factors. We have found no other attempts to examine the relation between depression and smoking among adolescents. In contrast, a recent paper cited seven studies that examined the relation between depressive disorders and drug and alcohol abuse.<sup>6</sup>

The present study reports our investigation into the relation between depressive symptoms and cigarette smoking among adolescents within the context of a multifactorial model.

## Methods

Subjects were 205 11th graders (123 boys and 82 girls) enrolled in a public science high school in a Northeast metropolitan area. This sample included all subjects present on the day our questionnaire was administered in seven non-elective health education classes; they comprised 35 percent of the school's total 11th grade population in the school year 1987-88. Enrollment into this school is competitive and requires passing a qualifying examination. We did not obtain ethnic information from our subjects. School records, however, showed the following ethnic breakdown for the total 11th grade class: 45 percent White, 33 percent Asian, 14 percent Black, 8 percent Hispanic, 0.5 percent American Indian. It is unlikely that our sample deviated

markedly from the total 11th grade class in ethnic distribution.

To enhance compliance and candid reporting, we developed a questionnaire that was short (limited to a single, double-sided page), anonymous, and noninclusive of potentially sensitive areas (e.g. grade point average, ethnicity, use of alcohol or drugs). Certain items were not answered by some respondents, accounting for the uneven group totals shown in the accompanying tables.

Subjects were asked whether or not they were regular smokers (at least one cigarette a day), the amount they smoked, the age of smoking onset, and the brand of cigarettes most frequently smoked. We also asked about the smoking behavior of parents, siblings, and friends; estimated parents' annual income; and number of siblings.

We selected 15 of the 20 (CES-D) items<sup>7</sup> to measure level of depressive symptomatology. The feasibility of using this scale with adolescents<sup>8</sup> and that of using a shortened version<sup>9</sup> have been demonstrated. To determine the specificity of an effect of depression, we included two other mental health measures: seven items from an inventory of "worries" used with schoolchildren<sup>10</sup> and from other instruments, assembled seven items assessing level of satisfaction with various life concerns (Appendix). Internal reliability (Cronbach) coefficients based on the total sample were 0.81 for the depression scale, 0.74 for worry, and 0.73 for satisfaction items.

We measured family structure by asking if the subject lived with one or both parents but did not determine whether the custodial parent was separated, divorced or widowed.

Yates corrected chi square analyses and t-tests were used in comparisons of boys vs girls, smokers vs nonsmokers, and highly exposed vs less exposed smokers. Multiple logistic regression<sup>11</sup> using a model that included all the study variables was employed to test the independence of observed associations with cigarette smoking. Quantitative measures were dichotomized at their median values.

## Results

We found an overall similarity between boys and girls on most of the psychosocial and smoking variables we studied (Table 1). The mean age of the sample was 16.1 (s.d. = 1.7) years. They were predominantly middle class (about 50 percent estimated their family income to be \$25,000-\$50,000), and living in two-parent households (73.6 percent). Only two children were not living with either parent.

The group prevalence of regular smoking (at least one cigarette daily) was 26.8 percent. It was higher in boys, who also reported smoking more cigarettes, than in girls. Girls reported a lower smoking rate among their mothers than their fathers, a difference that was not seen among the boys (Table 1).

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TABLE 1—Psychosocial and Smoking Characteristics of 205 11th Graders by Sex

Characteristics	Boys N = 123 (%)	Girls N = 82 (%)	Total N = 205 (%)
Age ≤16 years	85 (70.2)	57 (69.5)	142 (70.0)
Mean age (s.d.)	16.0 (2.1)	16.3 (0.6)	16.1 (1.7)
Family income			
<\$25,000	17 (16.3)	8 (12.1)	25 (14.7)
\$25,000–\$49,999	49 (47.1)	36 (54.5)	85 (50.0)
\$50,000>	38 (36.5)	22 (33.3)	60 (35.3)
Not the only child	96 (78.0)	63 (76.8)	159 (77.6)
Living with both parents	93 (76.2)	57 (69.5)	150 (73.6)
Regular smokers	34 (27.6)	21 (25.6)	55 (26.8)
Frequency of smoking			
1 cigarette/day	14 (41.2)	12 (60.0)	26 (48.1)
About 10–20	10 (29.4)	6 (30.0)	16 (29.6)
More than 20	10 (29.4)	2 (10.0)	12 (22.2)
Began smoking <15 yrs	19 (55.9)	12 (57.1)	31 (56.3)
Mean age began (s.d.)	14.1 (1.4)	15.5 (6.1)	14.7 (4.0)
Smoke brand with ≥1 mg nicotine	26 (76.5)	10 (52.4)	36 (66.3)
Friends who smoke			
Most or All	23 (22.1)	13 (17.6)	36 (20.3)
Some	49 (47.1)	34 (45.9)	83 (46.6)
None	32 (30.9)	27 (36.5)	59 (33.1)
Mother smokes:	26 (27.1)	9 (11.1)	35 (20.7)
Father smokes:	25 (26.6)	21 (25.9)	46 (27.5)
Siblings smoke:	7 (8.4)	8 (9.9)	15 (10.8)

Note: Percents shown are based on group totals that do not include missing answers.

Mean scores for each of the three mental health variables, i.e. depression, worry, and satisfaction, did not differ by sex. Depression was positively correlated with worry,  $r = .30$ , (205)  $p < .001$  and negatively correlated with satisfaction,  $r = -.36$ , (205)  $p < .001$ . Satisfaction and worry scores were negatively correlated,  $r = -.16$ , (205)  $p < .02$ .

Rates of cigarette smoking by selected factors are shown in Table 2. The most striking association with cigarette

TABLE 2—Prevalence of Regular Smoking by Selected Characteristics in a Sample of 205 11th Graders

Characteristics	% Smokers	Total N
Age		
≤16 years	23.7	142
>16 years	37.7	61
Family income		
<\$25,000	28.0	25
\$25,000–\$49,999	28.2	85
\$50,000>	28.3	60
Only child		
Yes	32.6	46
No	25.2	159
Live with both parents		
Yes	22.7	150
No	37.0	54
Father smokes		
Yes	39.1	46
No	29.8	121
Mother smokes		
Yes	45.7	35
No	29.1	134
Siblings smoke		
Yes	53.3	15
No	27.6	123
Friends smoke		
All	100.0	6
Most	80.0	30
Some	24.1	83
None	8.5	59

Note: Missing answers account for uneven group totals.

smoking was observed for peer smoking behavior. Smokers were also more depressed and worried, and less satisfied, than were nonsmokers (Table 3).

Multiple regression analysis (Table 4) showed that three variables were independently related with smoking status. As in the univariate analyses, the strongest relationship was observed for friends' smoking behavior (odds ratio = 7.7). An excess risk for smoking was also seen for respondents who scored above the group median (11>) on the shortened CES-D scale (odds ratio = 3.9), and for those who lived in a single-parent home (odds ratio = 1.9). Only children showed some risk for being a smoker but the confidence interval of the odds ratio (1.6) included 1. No interaction term was associated with smoking.

Smokers who smoked a pack or more a day reported a depression score of 22.7 compared to 15.4 for smokers of fewer cigarettes (difference = 7.3; 95% CL = 2.5, 12.1). No relation between age began smoking or nicotine yield of brand smoked and depressive symptoms was observed.

### Discussion

Our sample was drawn from a metropolitan high school for talented, high-achieving students. We can only speculate about the extent to which the competitive and demanding climate of their school environment engendered the preva-

TABLE 3—Mean (standard deviation) Scores of Regular Cigarette Smokers (n = 150) and Nonsmokers (n = 55) in a Sample of 205 11th Graders on Scales Measuring Depression, Worry, and Satisfaction

	Nonsmokers		Smokers		Difference (95% CI)
	Mean	(SD)	Mean	(SD)	
Depression	10.7	(6.4)	17.5	(7.9)	6.8 (4.7, 8.9)
Worry	8.9	(2.5)	9.8	(2.9)	0.9 (0.1, 1.7)
Satisfaction	28.3	(6.7)	25.7	(7.3)	2.6 (0.5, 4.7)

**TABLE 4—Multiple Logistic Regression of Smoking Status, Nonsmokers (0) vs Smokers (1) on Selected Characteristics of 205 11th Graders**

Independent Variables	Adjusted Odds Ratio	95% CI
Friends smoke (0 = None, Some; 1 = Most, All)	7.70	3.15, 18.8
Depression (0 = <11; 1 = 11>)	3.86	2.56, 5.82
Family structure (0 = 2 parents; 1 = 1 parent)	1.92	1.01, 3.71
Only child (0 = No; 1 = Yes)	1.62	.53, 4.95
Siblings smoke (0 = No; 1 = Yes)	1.13	.50, 2.59
Family income (0 = <\$25,000; 1 = \$25,000>)	.91	.48, 1.73
Age (0 = <16; 1 = 16>)	.90	.48, 1.68
Father smokes (0 = No; 1 = Yes)	.91	.44, 1.86
Mother smokes (0 = No; 1 = Yes)	.72	.33, 1.57
Worry (0 = <9; 1 = 9>)	.68	.37, 1.25
Satisfaction (0 = <28; 1 = 28>)	.57	.29, 1.16

Likelihood ratio  $\chi^2 = 41.84$ ,  $df = 11$ ,  $p < .001$

lence of depressive symptoms in our sample or the higher rate of smoking we observed (27 percent) compared to the rate seen in similar aged national samples (18 percent).<sup>12</sup> While these special characteristics of our subjects may limit the generalizability of our findings, they do not reduce their validity.

The strong and independent relationship between depressive symptoms and cigarette smoking confirms previous results obtained prospectively<sup>4</sup> and in a cross-sectional design.<sup>5</sup> The correlational nature of our study does not permit us to infer a causal relation or the direction of a causal sequence involving cigarettes and depression. However, neither a direct nor indirect effect from cigarette smoking to depression is likely. There is no evidence that nicotine, the major pharmacological agent in tobacco, causes depression,<sup>13</sup> and our data did not show more depression among smokers of high nicotine-content tobacco. Also, we did not observe that having more friends who smoked (which may reflect membership in a minority, deviant group) is correlated with higher depression. On the other hand, Kandel's observation<sup>4</sup> based on longitudinal data that cigarette smoking in adulthood is a sequela of depressive symptoms in adolescence supports an antecedent, if not causal, relation of depressive affect with cigarette smoking. An association between clinical depression and smoking status has been found in adult samples.<sup>14,15</sup> It remains to be seen whether such an association exists among adolescents as well since the CES-D, while potentially useful as a screening instrument, does not diagnose clinical depression.<sup>16</sup>

The rate of smoking among subjects living in single-parent homes was higher than the smoking rate in other subjects (37 vs 22 percent, respectively), an association that was independent of peer smoking behavior or depression rating. This finding agrees with an earlier observation that disruptive family events are directly associated with adolescent cigarette smoking.<sup>17</sup> In accord with Wills<sup>18</sup> coping model of smoking in adolescence, cigarette smoking may be

an attempt to mitigate the stresses brought on by parents' marital break-up. This explanation is compatible with the notion that parents' divorce may exacerbate the trend towards maladaptive coping among adolescents.<sup>19</sup> We offer these speculations with caution, however, since we obtained only limited information regarding the circumstances surrounding parents' separation.

Our results suggest that merely teaching youngsters how to "just say no" to their peers may not be enough. Depressive mood and parental separation appear to be additional risk factors contributing to the prevalence of smoking among adolescents. Multicomponent prevention approaches that will also address adolescents' emotional needs and the strains engendered by the home situation are indicated.

**APPENDIX**

**Depression Items (15 from the CES-D Scale)**

Below is a list of the ways you might have felt or behaved. Please indicate your answer.

- a) Rarely or none of the time (less than 1 day)
- b) Some or a little of the time (1-2 days)
- c) Occasionally or a moderate amount of time (3-4 days)
- d) Most or all of the time (5-7 days)

During the past week:

- A. I was bothered by things that usually don't bother me
- B. I did not feel like eating; my appetite was poor.
- C. I felt that I could not shake off the blues.
- D. I felt that I was just as good as other people.
- E. I felt depressed.
- F. I felt hopeful about the future.
- G. I thought my life had been a failure.
- H. My sleep was restless.
- I. I was happy.
- J. I talked less than usual.
- K. I felt lonely.
- L. People were unfriendly.
- M. I had crying spells.
- N. I felt that people dislike me.
- O. I could not get "going".

**Worry Items**

Almost everyone at one time or another is worried about something. Different people worry about different things. Read and check appropriately if it worries you.

	A lot	A little	Hardly ever
1. Not getting along with your parents	—	—	—
2. Not being popular	—	—	—
3. Feeling left out of things	—	—	—
4. Being made fun of	—	—	—
5. Being looked down upon	—	—	—

**Satisfaction Items**

For each area of life, choose the letter that corresponds with the level of satisfaction you get from that area.

- A) a very great deal
  - B) a great deal
  - C) quite a lot
  - D) a fair amount
  - E) a little
  - F) none
- a) city or place you live in \_\_\_\_\_
  - b) school work \_\_\_\_\_
  - c) hobbies or sports activities \_\_\_\_\_
  - d) extracurricular activities \_\_\_\_\_
  - e) family life \_\_\_\_\_
  - f) your friendships \_\_\_\_\_
  - g) your physical condition \_\_\_\_\_

**ACKNOWLEDGMENTS**

The authors are grateful to Alexander H. Glassman, Chief of Psychopharmacology, Department of Psychiatry, Columbia University for his general support, and to James Johnson, PhD, for helpful comments on an early draft. This study was supported in part by NIDA Grant #DA4732.

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