

# Persistence of Depressive Symptoms in Adolescents

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*To examine factors related to the persistence of depressive symptoms, we used a longitudinal follow-up survey of 1,176 adolescents aged 12 to 18 in the United States who reported notable depressive symptoms at baseline. Adolescents were interviewed by telephone at baseline in 1989 and at follow-up in 1993. The outcome of interest was a self-report measure of depressive symptoms experienced within the past 12 months at follow-up. Overall, 38.5% of adolescents reported persistent depressive symptoms. Marked gender differences were found, with 44.5% of girls reporting notable depressive symptoms at follow-up compared with 28.2% for boys. Moreover, current established smokers or experimenters were significantly more likely to report notable depressive*

*symptoms compared with never smokers (42.2%, 41.4% and 33.6%, respectively). Significant multivariate predictors of notable depressive symptoms at follow-up were female gender, change in sleep problems from 1989 to 1993, change in cigarette smoking status from 1989 to 1993, engaging in physical fights, and lack of participation in sports. Many adolescents report continued depressive symptoms over a period spanning four years. Several predictors of persistent depression were identified that could be important components of interventions targeting depressed adolescents. [Neuropsychopharmacology 25:S89–S91, 2001]*  
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Adolescent depression has been a focus of recent attention (Cole et al. 1999; Goodman and Capitan 2000). Depressive symptoms during adolescence are associated with a number of adverse health consequences including suicide and future risk of major depressive disorder (MDD) (Frost et al. 1999). Recent longitudinal, population-based studies have examined predictors of development of depressive symptoms in adolescents. In a previous study, we found that gender and cigarette smoking were associated with the onset of depressive symptoms (Choi et al. 1997). In contrast to research ex-

amining the course of MDD (Goodyer et al. 1991), there are few epidemiological data on the persistence of depressive symptoms during adolescence. The factors that promote development of depressive symptoms may differ from those that contribute to persistence or remission of depression. An improved understanding of the persistence of depressive symptoms as well as the potentially modifiable correlates of depression is needed to develop more effective intervention programs for depressed adolescents.

In this study, we examine factors associated with persistence of depressive symptoms in a longitudinal sample of 1,176 United States adolescents.

## METHODS

Data were gathered from the 1989 National Teenage Attitudes and Practices Survey (TAPS I) (Allen et al. 1992). TAPS I succeeded in interviewing 9,965 adolescents aged 12–18 years. Only 9,135 respondents reached by

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**Table 1.** Demographic Characteristics of Persistent Depression, Among Adolescents With Notable Depressive Symptoms at Baseline (N = 1,176)

Demographics in 1989	N	% with Persistent Depression in 1993
Total	1,176	38.5
Gender		
Male	433	28.2
Female	743	44.5
Age Group		
12–13	255	34.1
14–15	321	37.7
16–18	600	40.8
Race/Ethnicity		
White	848	38.2
Black	188	40.4
Hispanic	92	34.8
Asian/other	48	43.8
School Performance		
Much better than avg.	151	35.8
Better than avg.	332	36.4
Average/below avg.	693	40.1
Smoking Status		
Current	282	42.2
Experimenter	435	41.4
Never	459	33.6

telephone were eligible for follow-up survey in 1993. The follow-up telephone survey (TAPS II) was completed in 1993 by 87% of these adolescents (n = 7,960) who by that time were aged 15–22 years. The National Health Interview Survey (NHIS) uses a multistage sample design to provide national estimates of the non-institutionalized population. All data were weighted according to probability of selection and to represent the United States adolescent population with respect to gender, age, and race/ethnicity. This paper focuses on the 1,176 longitudinal-sample adolescents who reported notable depressive symptoms at baseline.

The measures are described in detail in another report (Patten et al. 2000). Demographic and psychosocial predictors assessed in 1989 included age, gender, race/ethnicity, cigarette smoking status, and sleep problems. A 5-item modified version of a previously validated scale (Kandel & Davies 1982) was used to assess depressive symptoms in 1989 and 1993. Total scores can range from 15 to 30, and scores of  $\geq 21$  indicate notable depressive symptoms.

## RESULTS

Table 1 presents the baseline distribution of adolescents reporting notable depressive symptoms in 1993 among the 1,176 reporting notable depressive symptoms in 1989. Of these 1,176 adolescents (433 girls, 743 boys), 453 (38.5%) reported notable depressive symptoms at follow-up. Using multiple logistic regression, signifi-

**Table 2.** Multivariate Predictors of Persistent Depressive Symptoms

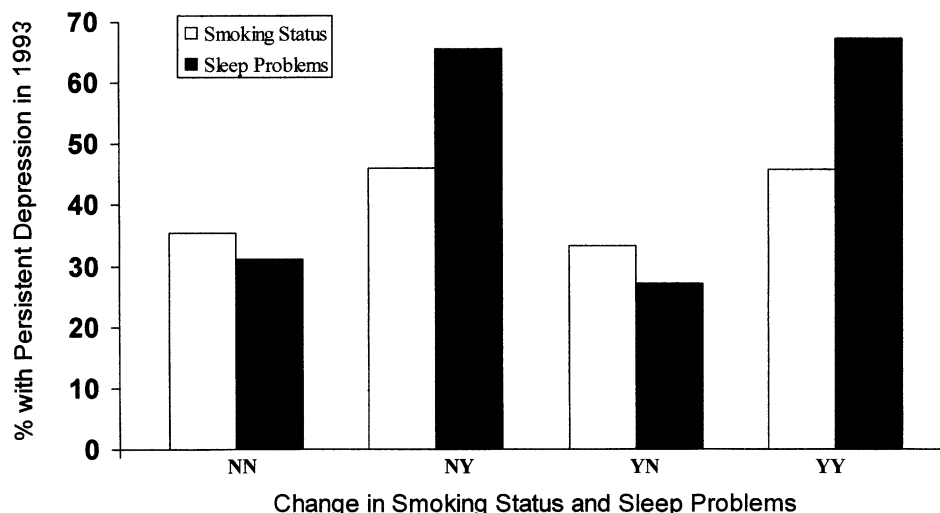
Predictors	n	Persistence of Depressive Symptoms Odds Ratio (95% CI)*
Age Group		
12–13	255	1.00
14–15	321	1.13 (0.77–1.65)
16–18	600	1.15 (0.81–1.64)
Gender		
Males	433	1.00
Females	743	2.21 (1.66–2.94)
Race/Ethnicity		
White	848	1.00
Black	188	1.23 (0.85–1.77)
Hispanic	92	0.81 (0.50–1.32)
Asian/Other	48	1.16 (0.61–2.24)
Perceived School Performance		
Much better than avg.	151	1.00
Better than average	332	0.86 (0.56–1.32)
Average/below average	693	0.94 (0.63–1.39)
Risky behavior		
No	494	1.00
Yes	682	1.11 (0.85–1.45)
Physical Fights		
No	794	1.00
Yes	382	1.38 (1.03–1.84)
Participation in Sports		
No	519	1.00
Yes	657	0.68 (0.52–0.89)
Smoking Status		
Not current established	799	1.00
No in 1989, Yes 1993	198	1.55 (1.09–2.20)
Yes in 1989, No in 1993	24	0.68 (0.26–1.74)
Yes in 1989, Yes in 1993	155	1.25 (0.83–1.89)
Sleep Problems		
No sleep problems	586	1.00
No in 1989, Yes in 1993	128	3.91 (2.57–5.94)
Yes in 1989, No in 1993	312	0.77 (0.56–1.06)
Yes in 1989, Yes in 1993	150	4.15 (2.79–6.17)

\*N = 1,176. Adjusted odds ratios and 95% confidence intervals.

cant predictors of notable depressive symptoms in 1993 among those with notable depressive symptoms in 1989 were female gender, engaging in physical fights, and lack of participation in sports (Table 2). As shown in Figure 1, changes in sleep problems and cigarette smoking status from 1989 to 1993 were also predictive.

## DISCUSSION

This study adds to the knowledge on persistence of depressive symptoms from an epidemiological sample of United States adolescents. The study of the trajectory of depressive symptoms and predictors of persistent depression are important components of a developmental psychopathology perspective of adolescent depression (Cole et al. 1999). Nearly 40% of adolescents reported continued depressive symptoms over a period span-



**Figure 1.** Percentage of adolescents with notable depressive symptoms in 1993 by changes in frequent sleep problems and cigarette smoking status among all 1,176 adolescents with notable depressive symptoms in 1989. YY indicates those adolescents with frequent sleep problems at both years; YN indicates those who reported frequent depressive symptoms at baseline but not at follow-up; NY indicates those without frequent sleep problems at baseline but who reported frequent sleep problems at follow-up; NN indicates those without frequent sleep problems at both years. Similar coding was used for cigarette smoking status.

ning four years. Assuming the majority of depressed adolescents are not receiving treatment, the findings suggest the need for secondary interventions to prevent escalation to more serious problems (e.g., suicidal attempts, MDD, alcohol abuse). In particular, future research is needed to evaluate whether interventions focused on reduction or prevention of sleep problems and cigarette smoking reduce the likelihood of continued depression in adolescents.

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