Increased Risk of Major Depression With Early Age of Exposure to Cigarettes

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Introduction: This study examined the association between age of initiation of cigarette use and increased risk of lifetime major depressive episode.

Methods: This study utilized publicly available data from the 2013 National Survey on Drug Use and Health involving a nationally representative sample of interviews of 55,160 randomly selected people aged ≥12 years. Analysis was conducted in 2016. Age of initiation of cigarette use was divided into four groups (≤12 years, 13–14 years, 15–18 years, and >18 years). Eligible participants included adults aged ≥18 years who had ever smoked a cigarette and had non-missing data for all analytic variables (n=23,906). Associations between lifetime major depressive episode and covariates were assessed using chi-square tests. Logistic regression was used to calculate crude ORs and AORs with 95% CIs.

Results: About half of participants reported starting cigarette use when they were aged 15–18 years. Compared with the group that initiated cigarette use at age ≤12 years, all other age groups were from 25% to almost 50% less likely to report a lifetime major depressive episode.

Conclusions: Early age of onset of cigarette use is associated with increased likelihood of experiencing a lifetime major depressive episode. Further research is needed to elucidate the mechanisms driving this association.
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Introduction

Depression remains a major health problem in the U.S. According to the 2007–2010 National Health and Nutrition Examination Survey, nearly one in 12 people aged ≥12 years in the U.S. suffers from depression.[1]

Previous studies[2–19] have attributed smoking to increased risk of depression. Boden et al.[3] suggested a cause-and-effect relationship between smoking and depression. Khaled and colleagues[6] and Breslau et al.[6,7] reported high prevalence of depression among tobacco users. Patton and colleagues[8] found an association between regular smoking and depression among girls of all ages and the boys in the youngest age group. Dos Santos et al.[4] found a higher rate of depression among current smokers than never smokers or previous smokers. Both of the adult cohorts of Elmasry and colleagues[2] and Williams et al.[2,13] were passive smokers from in utero through childhood whose mothers reported smoking during pregnancy and they themselves reported that somebody in their household smoked during their childhood. Upadhyaya and colleagues[12] conducted a meta-analysis of multiple small studies linking tobacco use with psychopathology. In the National Longitudinal Study of Adolescent Health with a cohort of 14,634 adolescents, Steuber and Danner[20] observed a pattern of increased depression among female adolescents at smoking onset and a decrease in depression during smoking cessation, supporting a possible causal link. Kang and Lee[5] demonstrated causal relation of smoking with depression in a longitudinal study. Although this was much larger than the other studies, it only involved subjects aged ≥20 years.

The aforementioned studies were either smaller in scale or had no specific mention of early exposure to tobacco, although they showed some association of smoking with increased risk of a lifetime major depressive episode (LMDE). Therefore, association between

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Table 1. Observed Frequencies and Weighted Prevalence; Characteristics of Participants, Smokers ≥18 Years (N=23,906)

Variable	Observed *n* (weighted %)
LMDE	4,122 (15.7)
Cigarette age of initiation	
≤12	3,781 (16.7)
13–14	4,152 (16.8)
15–18	11,928 (48.2)
>18	4,045 (18.2)
Age, years	
18–25	10,565 (12.7)
26–34	3,826 (16.5)
≥35	9,515 (70.8)
Race/ethnicity	
White, non-Hispanic	16,108 (72.5)
Black, non-Hispanic	2,465 (9.9)
Other, non-Hispanic	1,958 (5.2)
Hispanic	3,375 (12.3)
Gender	
Male	11,801 (51.9)
Female	12,105 (48.1)
Education	
<High school graduate	3,696 (12.7)
High school graduate	7,622 (30.0)
Some college	7,303 (28.2)
College graduate	5,285 (29.1)
Employment status	
Full-time	12,269 (51.5)
Part-time	4,274 (14.1)
Unemployed	1,996 (5.1)
Other	5,367 (29.2)
County	
Large metro	10,136 (51.4)
Small metro	8,228 (31.1)
Non-metro	5,542 (17.5)
Perceived health status	
Excellent	5,009 (20.0)

(continued)

Table 1. (continued)

Variable	Observed *n* (weighted %)
Very good	9,423 (36.8)
Good	6,834 (29.1)
Fair	2,161 (11.0)
Poor	479 (3.0)
Smoking in last year (yes)	13,001 (40.1)

LMDE, lifetime major depressive episode.

early age of smoking initiation and LMDE remains inconclusive. This study used a large database from the 2013 National Survey on Drug Use and Health to examine the association between age of cigarette use initiation and increased risk of an LMDE.

Methods

Study Sample

This study utilized data from the 2013 National Survey on Drug Use and Health involving a nationally representative sample of interviews from 55,160 randomly selected, non-institutionalized civilians aged ≥12 years from the Substance Abuse and Mental Health Data Archives for this cross-sectional secondary analysis in 2016.[21] Eligible participants for this study included adults aged ≥18 years (N=37,424) with a history of smoking a cigarette (*n*=24,117).

Measures

The primary outcome was an LMDE measured with questions to derive DSM-IV criteria for an LMDE.[22] An LMDE was defined as five of nine symptoms in the same 2-week period in which at least one was depressed mood or loss of interest. Participants were asked about their age of smoking initiation. Covariates included age, level of education, race, county of living, employment status, gender, smoking in the last year, and perceived health status.

Statistical Analysis

Data were weighted and analyzed with the complex survey methodology procedures in SAS, version 9.4, to account for initial selection probabilities and non-response patterns. Two hundred eleven (0.9%) non-respondents were excluded from analyses for missing data on any analytic variable, leaving a final analytic sample of 23,906. Associations of LMDE with age of cigarette initiation and covariates were assessed using chi-square tests. Logistic regression was used to calculate crude ORs and AORs with 95% CIs. Significance was set at an alpha level of <0.05.

Results

[Table 1](#) shows observed frequencies and weighted prevalence estimates of eligible survey participants. The