

E. A REVIEW: DEPRESSION AND SMOKING

Abstract: The association between depression and smoking has been well-documented in multiple countries and age groups. This review examines recent publications that address the magnitude of the association and its causal patterns (ie, due to lowered success of quitting in people with depression, depression causing smoking, smoking causing depression or third factor related to both smoking and depression). We conclude that the association may be multi-factorial with each of the causal directions possibly contributing to the observed association. Also, the association extends beyond depression to other mental disorders, including consumption of illegal drugs and non-medical use of prescription medications. Although the studies emphasize cigarette smoking, it is plausible to generalize the findings to other tobacco delivery systems involving deep inhalation, such as a hookah, due to the pharmacodynamics of nicotine. Although this review did not examine any studies specific to Arab Americans, the findings should generalize if smoking is stigmatized or, alternatively, as stigmatization increases. The good news is that even with the robust association between depression and smoking, people with depression can quit smoking and continue to be smoke-free. Because 44.3% of cigarettes in the United States are consumed by individuals with mental illnesses¹, mental illness deserves a prominent focus to allow our public health goal of reducing the prevalence of smoking to be reached. (*Ethn Dis.* 2007;17[Suppl 3]:S3-16-S3-18)

Key Words: Depression, Smoking

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INTRODUCTION

As smoking becomes a less-accepted behavior in different societies, the people who continue to smoke are more likely to be identified by certain characteristics. One characteristic is mental illness. The purpose of this review is to examine the association between mental illness and smoking and factors contributing to it. The association or observed co-occurrence between smoking and mental illness is robust across countries and within them, across age, race and sex. As a testimony to its robustness, the association is found even across different measures of mental illness and different measures of smoking. The data presented in this review will draw upon these studies, with an emphasis on more recent studies, and their various measures of mental illness and smoking.

BACKGROUND

One of the first national reports in the United States used results from the 1990–1992 National Comorbidity Study, an in-person survey estimating the prevalence of mental illnesses in a national representative sample between 15 and 54 years of age.² In that survey, data were collected on mental illness by highly trained lay interviewers using a structured interview with coded responses that followed Diagnostic and Statistical Manual of Mental Disorders (DSM) IIR criteria.³ A diagnose of smoking and nicotine dependence were assessed for those who reported they smoked daily. Lasser et al reported that of those with either a history of or current mental illness, 34.8% smoked daily.¹ For those with a current mental illness, 41.0% smoked daily. This prevalence of daily smoking was higher than that of individuals without a history of mental illness (22.5%). In addition,

people with mental illness consume 44.3% of the cigarettes in the United States.¹

Mental illness comprises multiple specific disorders, whether DSM-IV or the International Classification of Diseases (ICD) criteria are used. From the most recent United States national estimates (from the years 2000–2003 with DSM-IV criteria),⁴ anxiety disorders have the highest 12-month prevalence of mental disorders (18.1%) followed by mood disorders (9.5%). Within mood disorders, there are various disorders, including Major Depressive Disorder (MDD). It is estimated that 6.6% currently meet criteria for having MDD, with 16.2% either having current MDD or a history of it. Highlighting its importance, a high proportion of individuals with MDD has severe or very severe impairment (50.9%) and few are adequately treated (21.7%).

In the 1997 National Household Survey on Drug Use, which sampled individuals aged ≥ 12 years of age living in households, Richter et al found MDD, as well as the use of illegal drugs or non-medical use of prescribed medications, to be associated with smoking in the past 30 days.⁵ This association held even after controlling for age, sex, race, education, regular source of care, ever in drug treatment, perceived risk of smoking and alcohol binges.

STUDY REVIEWS

Lasser et al found the quit rate for people with current mental illnesses to be lower (30.5%) than those with history of mental illnesses (37.1%) or those without a history of mental disorder (42.5%).³ Specific to depression, Breslau et al followed a cohort of young people in southeastern Michigan

and found the five-year quit rate did not vary by depression status at baseline (19.0 vs. 21.6%).⁶ In contrast, Glassman et al found a statistically significant difference of successfully quitting smoking by depression status when investigating clonidine as an aid for smoking cessation.⁷

Hitsman et al conducted a meta-analysis and found no difference in the quit rate for those with or without depression in the short term (three months) or longer term (six months).⁸ It is possible that the meta-analysis did not examine a long enough timeframe. It has been reported that people, who relapsed after successfully quitting smoking, were more likely to report that they smoked when having a negative mood.⁹ To help predict who will relapse, Abrams et al used laboratory procedures with former smokers and current smokers. They found the former smokers displayed better coping and less physiologic responses to stressful situations than current smokers.¹⁰

Because research has demonstrated that lower quit rates are found for those with depression, relapse was related to negative mood and that one of the withdrawal symptoms from smoking is depressed mood, it was logical that antidepressants be examined as a smoking cessation aid. In 1997, the US Food and Drug Administration approved Bupropion for the treatment of smoking. This approval was based upon three clinical trials that found 18% of those assigned to bupropion quit smoking vs 5% of those assigned to a placebo.¹¹

Other antidepressants were subsequently examined. One, fluoxetine, was investigated in Detroit.¹² In 150 daily smokers, who received cognitive-behavioral therapy and nicotine patches, there was no difference in smoking cessation between those who received placebo and either of two doses of fluoxetine. The antidepressant was associated with ameliorating weight gain among those who quit smoking. It was also associated with

ameliorating self-reported withdrawal symptoms. However, it had no impact on smoking cessation, either for the entire sample or sub-samples defined as people with history of MDD or current depressive symptoms. The use of cognitive behavioral therapy (and nicotine patch) may have played a major role in addressing coping strategies and dealing with negative affect.

If the quit rate is not responsible for the association between depression and smoking, does smoking cause depression or depression cause smoking? To answer this question, observational studies must be used. The cohort assembled by Breslau et al, as described above, would be ideal to examine these questions. They reported that MDD predicted progression to daily smoking (23.0 vs. 9.3%, OR=3.0).¹³ In addition, smoking status at baseline predicted MDD five years later (12.1 vs. 6.5%, OR=1.9). Although controlling for conduct disorder weakened the associations; they still showed consistent dose-responses for both directions of the association.

In Norway, Klungsøyr et al recently reported on a cohort of adults followed for 11 years.¹⁴ Consistent with Breslau et al, they found a dose-response between smoking quantity and years and later development of ICD-10-defined depression. The risk of developing a first episode depression was four times higher in the heavy smokers compared to those who never smoked.

The temporal sequence of depression predicting later smoking has also been found in children. In Australia, Patton et al surveyed 2032 children and found depression and anxiety predicted smoking in both boys and girls when their peers smoked.¹⁵ In California, Weiss et al followed an ethnically diverse sample of children between 6th and 7th grade.¹⁶ Among other factors, they found depressive factors at baseline predicted smoking the next year and more frequent smoking among those already smoking.

In addition to cohort studies where data are collected from different time points, cross-sectional surveys can address temporal sequence. Using data from the National Comorbidity Study, Breslau et al examined the sequence of mental illnesses and smoking using self-reported timing of these events.¹⁷ They found consistent and strong associations between current or active mental illness and progression to daily smoking or to nicotine dependence. This latter diagnosis is defined by criteria such as difficulty quitting, presence of withdrawal symptoms when abstaining, excess time spent smoking/acquiring cigarettes and tolerance of smoking symptoms.¹⁸ The associations held across a variety of mental illness, including MDD.

From these studies, it appears that smoking predicts depression and depression predicts smoking. However, the association may not be causal if a third factor could explain these findings. Kendler et al used a sample of United States White female twins to examine genetic factors predisposing to smoking and depression.¹⁹ They concluded that smoking and depression co-occurred but that the association was due to an inherited predisposition to both. The results, while provocative, have not been examined to our knowledge in other more diverse samples.

In a separate genetic study, Audrain-McGovern et al, found that an interaction of specific genetic variants and depression predicted progressing to a higher level of smoking in adolescents.²⁰ The genetic variants did not, however, predict smoking initiation.

Others have supported the argument that a third factor contributes to the association of depression and smoking. Covey et al argued in their study of adolescents that high level of stress and specific (maladaptive) coping strategies may encourage both smoking and development of depression.²¹ A recent report from China found smoking ("ever had a puff") and past 30-day

smoking in early and late adolescents to be associated with a way to regulate mood, either for relaxing or energizing.²² Although smoking is not stigmatized in Chinese adults, it is stigmatized for adolescents, especially girls. The observed associations may not have found such a high endorsement if smoking were normative.

CONCLUSIONS

From the data presented here and the extensive literature not reviewed, it is apparent that depression and smoking are associated, at least in countries or subgroups where smoking is stigmatized, and the association may be multifactorial in nature. Moreover, it appears that the association between smoking and mental illness extends beyond depression to other disorders, including consumption of illegal drugs and non-medical use of prescription medications. Although the studies emphasize cigarette smoking, it is plausible to generalize the findings to other tobacco delivery systems involving deep inhalation, such as a hookah, due to the pharmacodynamics of nicotine. Although the review did not examine any studies specific to Arab Americans, the findings should generalize if smoking is stigmatized or, alternatively, as stigmatization increases. The good news from this review is that even with the robust association between depression and smoking, people with depression can quit smoking and continue to be smoke-free. In addition, with 44.3% of cigarettes being consumed in the United States by individuals with mental illnesses, mental illness deserves a promi-

nent focus if our public health goal of reducing the prevalence of smoking is to be reached.

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