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Smoking and Suicide among Nurses

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ABSTRACT

Current evidence suggests a strong positive correlation between cigarette consumption and depression; this study examined the relationship between cigarettes and suicide. Over 100 000 predominantly White, middle-aged, female registered nurses were followed via biannual questionnaires from 1976 through 1988. Respondents smoking 1 through 24 cigarettes per day had twice the risk and those smoking 25 or more cigarettes four times the risk of committing suicide, compared with those who had never smoked. Although no information on causation was available, this paper links cigarettes to another major health problem. (*Am J Public Health.* 1993;83:249–251)

Introduction

Cigarette smoking is the single most important, preventable cause of death in the United States and represents the largest public health problem in the nation. Smoking is a risk factor for lung cancer, chronic obstructive pulmonary disease, coronary heart disease, and stroke.[1]

Researchers have attempted to establish links not only between smoking and physical well-being but also between smoking and mental health problems,[2–5] particularly depression.[6–12] Most current evidence suggests a strong positive correlation between cigarette consumption and depression.[13]

In this report, we examine the relationship between cigarettes and suicide.

Methods

In 1976, 121 700 female registered nurses 30 to 55 years of age, living in 11 large US states, completed a mailed questionnaire on known and suspected risk factors for cancer[14] and coronary heart disease.[15] Based on a subsample, we estimated that at least 98% were White. Every 2 years a follow-up questionnaire has been sent to update the information and to record the occurrence of major health problems.

Most deaths are reported by the subject's next of kin or by postal authorities. After each follow-up questionnaire, we search state records for deaths among the nonrespondents. Ascertaining deaths from independent sources compared with those obtained through the National Death Index allows us to estimate that more than 96% of deaths in this cohort are identified.[16] Death certificates are obtained for all deaths in the cohort and reviewed by a physician blind to exposure information.

Our analysis covers the 12-year period from 1976 to 1988. In 1988, 103 602 nurses responded to the follow-up questionnaire, 3481 had died during the interval, and 14 617 either refused to continue in the study or failed to answer five regular mailings and one certified mailing. The National Death Index was searched for deaths for all of these women.

For each of the six 2-year periods, the nurses were divided into 5-year age categories (30 to 34 through 60+). Respondents were also divided into four smoking categories—never smoked, exsmoker, 1 through 24 cigarettes per day, and 25 or more cigarettes per day—according to their status at the beginning of the period. A woman could switch categories in different periods. Less than 2% of the women failed to respond to the smoking question in any period.

Results

One hundred thirty-six of the subjects committed suicide between 1976 and 1988, which constitutes a rate of approx-

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TABLE 1—Suicides in Cohort, 1976 through 1988, by Age

Age, y	No. of Cases	Population[a]	Relative Risk	95% CI
30–34	7	81	1.51	0.63, 3.66
35–39	19	194	1.72	0.89, 3.31
40–44	16	280	1.00	. . .
45–49	24	291	1.44	0.77, 2.71
50–54	35	292	2.10	1.18, 3.74
55–59	26	209	2.18	1.18, 3.99
60+	9	90	1.75	0.78, 3.93

[a]In thousand person-years.

TABLE 2—Cohort Incidence of Suicide, by Smoking Status, 1976 through 1988

	No. of Cases	Population[a]	Age-Adjusted Relative Risk	95% CI
Never smoked	38	618	1.00	. . .
Ex-smoker	32	395	1.30	0.81, 2.09
1–24 cigarettes/d	33	287	1.93	1.21, 3.08
25+ cigarettes/d	30	117	4.21	2.71, 6.56

Note. Three deaths are missing as a result of unknown cigarette consumption.
[a]In thousand person-years.

imately 1.2 suicides per 100 000 person-years. Similar to national White female suicide rates for 1980,[17] the risk for suicide appears to peak in women in their 50s (Table 1).

Cigarette smoking was positively associated with suicide. Those who smoked 1 through 24 cigarettes per day had twice the likelihood of committing suicide as those who had never smoked (Table 2). Women who smoked more than 25 cigarettes per day had four times the likelihood of suicide in the succeeding 2 years as those who had never smoked (relative risk = 4.21, 95% CI = 2.71, 6.56).

Discussion

Most recent evidence suggests a "chronic and pernicious interrelationship between cigarette smoking and depression."[7] Depressed adolescents are more likely to begin smoking,[18] to smoke more,[19,20] and to continue smoking as young adults.[11] Smokers with major and mild depression find it harder to quit.[7,21–23] Relapse rates are also higher among depressed ex-smokers.[24,25]

The reasons for the cigarette–depression connection are unclear. Hughes[26] suggests three possible explanations: (1) self-medication of depression with nicotine, (2) a common personality characteristic (e.g., low self-esteem) predisposing to both nicotine and depression, and (3) a genetic linkage. The best positive evidence concerns the self-medication hypothesis. Both survey and experimental studies show that nicotine reduces negative affect in smokers.[27] It is also conceivable that poor personal health habits, including smoking, may cause depression[9] or that smoking may lead to increased depression because of the low social status accorded to smokers and the difficulties in quitting.[7,8]

There has been some suggestion in the literature of an association between cigarette smoking and suicide; however, many of the studies involved have serious limitations.[28–31] A prime advantage of our investigation is its size—prospective data were collected on over 100 000 women. Although cigarette consumption is based on self-report, the presumption that these trained nurses are reliable reporters in general has been corroborated by various validity checks.[15] The questionnaire has also been used in other epidemiologic studies on the relationship between smoking and disease.[32]

The fact that respondents were middle-aged, female nurses and almost all were White may limit the generalizability of the results. On the other hand, this narrow grouping, along with adjustment of the results for age, holds constant sex, race, age, and occupation, factors known to be associated with suicide.[33–35]

The primary limitation of the analysis is that information was not available on many of the other factors that affect suicide rates. These factors include socioeconomic and demographic data such as migration, urbanization, unemployment, religion, divorce and bereavement.[33,34,36,37] and mental and physical health data such as alcoholism, drug abuse, sexual deviance, emotional instability, risk taking, dichotomous thinking, hopelessness, depression or other mental disorder, physical illness, and previous suicide attempt.[33,35,38–41]

It is widely accepted that suicides are underreported[42] and that much variability exists in the suicide death reporting process.[43] Nonetheless, death certificates often provide the only available data on suicides and are used extensively in suicide research. Recent analysts argue that official suicide statistics relying on death certificates are appropriate for epidemiological research.[44,45]

This study presents solid evidence of a strong positive association between smoking and completed suicide. One reason is the direct connection between cigarettes and depression. Other possible routes are from smoking to physical disease and disease to suicide. For example, patients suffering from cancer are at risk for taking their own lives[38,46,47]; the smoking–cancer association is well documented.[27] Similarly, alcoholism and smoking are positively associated.[48] Up to 18% of all alcoholics commit suicide, and up to 20% of all suicides are alcoholics.[49] Smoking is also associated with other mental health problems, such as schizophrenia,[3] that are related to self-destructive behavior.[50] Unfortunately, we have no information on actual causation.

This paper links cigarettes to another major health problem. Further research is required to explicate the smoking–suicide relationship fully. □

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