

## Consumption of Coffee or Tea and Symptoms of Anxiety

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**Abstract:** The relationship of consumption of coffee or tea to self-reported symptoms of anxiety is examined with data from the detailed examination component of the National Center for Health Statistics Health and Nutrition Examination Survey. Among this nationwide sample of 3,854 respondents, there was no significant association between consumption of coffee or tea and symptoms of anxiety. (*Am J Public Health* 1984; 74:66-68.)

### Introduction

Caffeine intake has been associated with bladder cancer,<sup>1</sup> cardiovascular disease,<sup>2,3</sup> cancer of the pancreas,<sup>4</sup> and birth defects.<sup>5</sup> In none of these areas is the evidence conclusive, and for most of these disorders there are studies showing little or no effect.<sup>6-10</sup> On the other hand, there is clear evidence that caffeine has strong effects on blood pressure, levels of catecholamines, and various other physiologic and psychotropic variables.<sup>11,12</sup> Nevertheless, we were unable to locate any epidemiologic studies on the relationship of caffeine intake to symptoms of anxiety. A study based on case reports suggests symptoms of "caffeinism" can be indistinguishable from anxiety neurosis.<sup>13</sup> A double blind placebo crossover study of 19 prepubertal and 20 college-age boys showed no significant differences on self-reported anxiety symptoms after administration of caffeine.<sup>14</sup> There are also some case studies linking caffeine to psychosis.<sup>15</sup> The diagnosis of anxiety disorders therefore appeared to be a prime candidate for research on the effects of caffeine.

### Methods

In the first Health and Nutrition Examination Survey (HANES I), conducted by the National Center for Health Statistics, approximately 28,000 persons were chosen as a probability sample of the civilian non-institutionalized population of the United States for the survey,<sup>16</sup> yielding approximately 21,000 examinations. The sample was restricted to those respondents between the ages of 1 and 74. These respondents were given a general medical examination and basic laboratory tests, and were asked to fill out 24-hour food recall and food frequency questionnaires. One question

asked for the number of cups of coffee or tea consumed per day. Of the original sample, 3,854 respondents in the age range 25-74 were also given a more detailed examination which included a self-administered mental health scale, the General Well-Being Questionnaire (GWB).

The HANES sample is a multi-stage cluster design which oversamples certain groups thought to be at high risk for malnutrition. The individuals given the detailed examination were chosen from the overall sample in a strict probability manner also, so that, after appropriate weighting, they represent the non-institutionalized population of the United States. All the results presented below are weighted to represent the US population.

The General Well-Being Questionnaire was designed to measure overall mental health status among members of the general population.<sup>17</sup> It can be disaggregated into six distinct subscales.\* The subscales, or close approximations of them, have undergone tests for internal consistency, homogeneity, content, and construct validity in a study in Dayton, Ohio,<sup>18</sup> and criterion validity in Milwaukee, Wisconsin.<sup>19</sup> The anxiety scale which was tested in the Dayton study had one more item than the scale used here, and this five-item scale had an alpha coefficient of .88 on a sample of 1,209 respondents and a one-week test-retest correlation of .70 on a sample of 830.<sup>18</sup> The scale was highly positively correlated with measures of chronic stress, stressful life events, perceived mental or emotional problems, and visits for professional mental health care, and negatively correlated with life satisfaction, as would be predicted. In the Milwaukee study, the exact GWB items were used, and the correlation of the anxiety subscale with other measures of anxiety was between .51 and .76.

The four items that comprise the GWB anxiety subscale are:

- Have you been anxious, worried, or upset?
- Have you been under or felt you were under any strain, stress, or pressure?
- Have you been bothered by nervousness or your "nerves"?
- How relaxed or tense have you been?

All questions are asked within the context of the past month. The first three items are scored from 0 to 5 and the last item is scored from 0 to 10 with high anxiety being the low score. The range in the sample was from 0 to 25, and the mean score was 18. About 23 per cent scored less than 15 on the scale, which was used as a cutoff score for high anxiety in Table 2 below.

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\*Freedom from worry, energy level, satisfaction with life, depression, anxiety, and emotional control. The scale on energy level, which might also be of interest here, did not perform satisfactorily in these tests.

**TABLE 1—Correlation Coefficients, Cups of Coffee or Tea per Day and Symptoms of Anxiety by Age and Sex**

	Males			Females			Total
	Less than Age 45	Age 45–64	Age 65 and Older	Less than Age 45	Age 45–64	Age 65 and Older	
Coffee Drinkers (n)	.043 (567)	-.022 (770)	.043 (376)	-.035 (670)	.062 (812)	.036 (395)	.008 (3590)
All Respondents (n)	.043 (597)	-.017 (802)	.036 (405)	-.031 (713)	.043 (843)	.039 (416)	.007 (3776)

**TABLE 2—Coffee or Tea Consumption and Symptoms of Anxiety**

Level of Consumption in Cups of Coffee or Tea	Estimated Population*	Per Cent with High Levels of Anxiety	Number in Sample**
None	3,900,093	22	186
Less than one per week	2,258,984	33	83
1–3 per week	3,589,685	21	150
4–6 per week	2,363,812	22	84
One per day	18,561,777	28	792
Two per day	25,642,398	22	902
Three per day	21,425,473	20	797
Four per day	11,203,246	21	375
Five per day	6,352,043	28	200
Six per day	3,199,035	23	97
Seven or more per day	3,909,121	23	110
Total with known consumption	102,405,667	23	3776
Unknown	1,719,291		78

\*Weighted estimate.

\*\*Unweighted frequencies.

### Results and Discussion

Seventy-eight respondents did not complete the food frequency questionnaire so the relevant sample size is 3,776. The correlation between the anxiety scale and number of cups of coffee or tea consumed per day is not significantly different from zero at any reasonable level (Table 1).\*\* Taking account of the complex sample design usually lowers the level of significance since the design effect of the HANES sample is greater than one; even so we also calculated the significance of the correlation as if the sample design were simple random, but the correlation (.007) remained non-significant. Separate coefficients for six different sex-age groups are presented in Table 1. None of the correlations are significant.

It is possible that consumption of caffeine is only related to symptoms of anxiety when it is greater than some threshold level. To study this possibility, the entire range of consumption is presented in Table 2 with the anxiety scale dichotomized to focus on those with relatively high levels of anxiety.\*\*\* In each of these two extreme categories, about 22–23 per cent of the group have scores revealing high levels of anxiety. There is some wiggling around of the results in the categories between the extremes, but the trend is about as flat as one can expect.

\*\*The significance test for the correlation was calculated taking the sample design into account using the Taylor series method of variance/covariance estimation.

\*\*\*The lower limit of consumption is the group who report never drinking coffee or tea, and the high limit is those who report drinking more than seven cups of coffee or tea per day. Seven cups is about 750 milligrams of caffeine, or three times what Greden<sup>13</sup> referred to as a "large" dose.

Table 2 is calculated using the sample weights, so that the results are representative of the United States, but the unweighted frequencies are at the far right so that the reader can have some idea of the stability of the percentages. When we calculated this Table without the weighting, the results were very similar. We also looked at the association of the four individual items on the anxiety scale with coffee and tea consumption, in case there was a single item for which the association was strong, which might have been masked in the total scale score. No item stood out in this way. We tried several different cutting points for the anxiety scale as a whole, and for the association of individual items with coffee or tea consumption, but there were no cutting points which generated a stronger pattern of results than are displayed in Table 2.

It could be that coffee and tea drinkers who suffer symptoms of anxiety stop drinking it. It could be that the effects of caffeine consumption are limited to a very short time period after consumption, and do not endure for as long as one month. Or it could be that other sources of caffeine, such as that from soft drinks, produce anxiety symptoms, independently of coffee or tea drinking. But in all these circumstances, as well as many others that we have considered, one would expect some sort of positive relationship of coffee and tea intake to the symptoms of anxiety studied here, and none of our analyses revealed even a remote suggestion of an association.

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## Homicide in Childhood: A Public Health Problem in Need of Attention

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**Abstract:** Homicide is now among the five leading causes of death in childhood, accounting for 1/20 deaths of those <18 years of age. Based on childrens' changing developmental vulnerabilities, it is possible to characterize three subtypes of child homicide—infanticide, fatal child abuse and neglect after infancy, and homicide in the community. Specific approaches to primary prevention include measures to strengthen families and their community support systems, and to educate adults and children concerning appropriate behaviors of children at different ages. (*Am J Public Health* 1984; 74:68-70.)

### *Epidemiology of Homicide in Childhood*

As the only leading cause of death of children under age 15 to have increased in incidence in the last 30 years,<sup>1</sup> homicide warrants review and emphasis as a concern of the public health community. Figures 1 and 2 show the dramatic increase in childhood homicide rates since 1925.<sup>2</sup>

Whether due to increased incidence or increased recognition, homicide is now among the five leading causes of childhood mortality,<sup>2,3</sup> accounting for one of every 20 deaths

of those <18 years old in 1978.<sup>4</sup> The incidence of homicide in childhood is bimodal (Figure 3), with peaks in very early childhood and in late adolescence. Children <15 years old accounted for one of every 25 homicide victims in the United States in 1980.<sup>5</sup>

Homicide victims tend to be male at all ages; approximately half of victims under 15 and three fourths of victims 15 and older. At all ages, 40-50 per cent of homicide victims are Black.<sup>5</sup>

Weapon<sup>5</sup> and perpetrator<sup>4</sup> distribution differ markedly with victim age (Table 1 and Figure 3). Beatings account for a high proportion of homicides in early childhood; the proportion of deaths due to arson is highest in the 5-9 age group; the proportion of deaths due to firearms increases with age; reaching adult proportions at age 15. Figure 3, showing perpetrator distribution and homicide rate by age, indicates that the majority of homicide victims in infancy are killed by parents and relatives, and the proportions of strangers, acquaintances, and unidentified perpetrators rises dramatically in adolescence.

### *Developmental Basis for Risk*

The developmental epidemiology of childhood homicide can be conceptualized as including three subtypes: infanticide, fatal child abuse and neglect by supervising adults occurring after infancy, and homicide involving social vulnerability in later childhood.

Homicide is most prevalent during infancy.<sup>4,6-10</sup> Historical<sup>11</sup> and cross-cultural<sup>12</sup> evidence suggest that infanticide is a separate entity from later child homicide and from other child abuse. Infant victims suffer a predominance of central

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