

Nightmares as Predictors of Suicide

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Study Objectives: To examine the relationship between the frequency of nightmares and the risk of suicide.

Design and Setting: A prospective follow-up study in a general population of Finland starting in 1972.

Participants: A total of 36,211 subjects (17,700 men and 18,511 women) aged 25–64 years at baseline.

Interventions: N/A

Measurements: The study included self-administered questionnaires (mainly questions on socio-economic factors, medical history, health behavior, and psychosocial factors) and health examination at the local primary healthcare center. The frequency of nightmares was estimated. The subjects were followed until Dec. 31, 1995, or death. Information on deaths caused by suicide (n=159) or other self-inflicted injury was

obtained from the National Death Register by computerized record linkage using the national personal identification code assigned to every Finnish resident. Using the Cox proportional hazards regression model we controlled for several potential confounding factors.

Results: The frequency of nightmares was directly related to the risk of suicide. Among subjects having nightmares occasionally the adjusted relative risk of suicide was 57% higher, and among those reporting frequent nightmares 105% higher compared with subjects reporting no nightmares at all.

Conclusions: This is the first study to report a direct and graded association between the frequency of nightmares and death from suicide in a general population.

Key words: Death; nightmare; risk; suicide

INTRODUCTION

PATTERNS OF SLEEP DISTURBANCES ARE ASSOCIATED WITH SEVERAL PSYCHIATRIC ILLNESSES.¹ Nightmares are generally understood as frightening dreams, with vivid and terrifying nocturnal episodes,² but they are different from bad dreams.³ A sleep disturbance, a nightmare disorder, is included in *DSM-IV*⁴ and in *ICD-10*,⁵ and recurrent nightmares are the most defining symptom of post-traumatic stress disorder.^{4,5}

In general populations, nightmares have been shown to be associated with psychological problems,⁶ and with the presence of depressive disorder, anxiety disorder, or with both disorders together.⁷ In a large twin study, the frequency of nightmares was associated with psychiatric disorders in a graded manner.⁸ In patient series there are findings to suggest an association between rapid eye movement (REM) sleep abnormalities and suicidal behavior both in patients with major depression⁹ and in psychotic patients.¹⁰ Insomnia, hypersomnia, and subjective sleep quality have also been reported to be related to suicidal behavior in patients with major depression,^{11,12} and with panic disorder.¹³ In a case-control study, major depressive patients with nightmares at least twice a week had higher suicide scale scores and were more likely to be classified as suicidal than depressed patients never having nightmares.¹⁴ No previous study has evaluated the possible association between the frequency of nightmare, and the risk of actually committed suicide.

The purpose of our large, prospective, population-based study was to estimate the relative risk of suicidal deaths among adult subjects reporting different frequency of nightmares in Finland, where the rate of suicide is high.

METHODS

Five independent cross-sectional population surveys in the National Finrisk Study (in 1972, 1977, 1982, 1987, and 1992) have assessed the levels of risk factors primarily for cardiovascular disease in eastern, southwestern, and southern Finland. For each survey, an independent random sample of adult men and women aged 25–64 years was drawn from the National Population Register. The surveys included self-administered questionnaires (mainly questions on socio-economic factors, medical history, health behavior, and psychosocial factors) and health examination at the local primary healthcare center. The questionnaires were mailed to the sample participants and returned in person to the survey sites, where specially trained nurses checked them, asked additional questions, and took all the measurements (height, weight, and blood pressure). A venous blood sample was also taken for determination of various biochemical factors (e.g., serum cholesterol concentration). The main questions and examinations of interest were kept unchanged to ensure comparability between the 20-year-survey period. The participation rates were satisfactory (72%–94%). Details of the survey procedures have been described in earlier reports.^{15,16} All the study procedures were carried out in accordance with the ethical standards of the Helsinki Declaration and the World Medical Association.

The subjects (n=36,211) were followed until Dec. 31, 1995, or death. The mean follow-up was 14.4±6.9 (range 0–24) years totalling 522 150 person years of observation. Information on deaths caused by suicide (N=159) or other self-inflicted injury was obtained from the National Death Register by computerized record linkage using the national personal identification code assigned to every Finnish resident. The end points were the codes E950–E959 of the *International Classification of Diseases (ICD)*. *ICD-8* was used from 1972 to 1986 and *ICD-9* from 1987 to 1995.

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Table 1—Prevalence (%) of nightmares during the past month by gender and age

Frequency of nightmares	Age group (yrs.)				Total
	25-34	35-44	45-54	55-64	
Men					
Not at all	66.7	65.3	60.4	57.3	62.9
Occasionally	31.5	32.1	35.5	36.7	33.7
Frequently	1.8	2.6	4.1	6.0	3.4
(N)	4,809	4,937	4,606	3,348	17,700
Women					
Not at all	51.3	53.7	55.6	57.7	54.4
Occasionally	44.7	41.5	38.8	36.4	40.6
Frequently	4.0	4.8	5.6	5.9	5.0
(N)	4,810	4,930	4,932	3,839	18,511

The frequency of nightmares was estimated with a question: “How often have you had nightmares during the past month?” There were three response options: “frequently,” “occasionally,” and “not at all.” The “nightmares” were not defined for the participants.

Age was used as a continuous variable in the multivariate analysis. Marital status was dichotomized (married vs. single/divorced/widowed). Employment status (employed/retired vs. unemployed) was considered as confounding factor. Criteria for a heavy use of everyday psychoactive substances were: alcohol intake >120 g/week; smoking ≥20 cigarettes/day; coffee drinking ≥7 cups/day. Irregular physical activity was defined as having leisure-time physical activity once a week or more seldom. Symptoms of insomnia, depressed mood, life stress, and anxiety were also estimated with a question: “How often have you had insomnia/depressed mood/life stress/anxiety during the past month?” (not at all/occasionally vs. frequently). Use of psychotropic medication (antidepressants, anxiolytics, hypnotics) was also recorded (no vs. yes). Very high serum cholesterol concentration was defined as ≥8.00 mmol/l.

The relationships between categorical variables were estimated by the Mantel-Haenszel chi-square test for linear association, and between continuous variables by analyses of variance. Adjusted hazards ratios (with 95% confidence intervals) were computed from the coefficients estimated by the Cox proportional hazards regression model with the proc phreg program in the SAS/STAT Software controlling for the above-mentioned potential covariates.

RESULTS

Table 1 shows that the prevalence of nightmares was higher among women than among men (45.6% vs. 37.1%, $\chi^2=268.6$, $df=1$, $p<0.001$). The proportion of those with nightmares increased with age in men, but decreased in women. The percentage of those with frequent nightmares increased with age in both genders.

Data on confounding factors are presented in Table 2. The subjects having nightmares were older, more often females, not married, unemployed, heavy smokers, and alcohol users, experienced more often symptoms of insomnia, depressed mood, life

stress and anxiety, and used more psychotropic medication compared with subjects who reported no nightmares at all. Heavy coffee drinking and very high serum cholesterol did not differ significantly between the nightmare categories. In addition, when analyzed by sex, the frequency of nightmares was positively and significantly associated with heavy coffee drinking in women, and with very high serum cholesterol in men (data not shown).

During the mean follow-up of 14.1 ± 6.9 (range 0–24) years there were 129 suicides among 17,700 men (51.8/100,000 person-years) and during the mean follow-up of 14.8 ± 6.9 (range 0–24) years 30 suicides among 18,511 women (11.0/100,000 person-years). The most common suicide methods were hanging or strangulation ($n=68$), firearms or explosives ($n=38$), drug overdose ($n=28$), poisoning with gases or vapors ($n=8$) and drowning ($n=8$).

The frequency of nightmares was directly ($p=0.0033$ for linear trend) related to the risk of suicide (Table 3). Among subjects having nightmares occasionally the adjusted relative risk of suicide was significantly increased, and among those with frequent nightmares the risk was over two-fold compared with the reference category of people who had no nightmares at all. We also analyzed the data by sex. In male nightmare (occasional and frequent combined) sufferers the adjusted relative risk of suicide was 1.66 (95% CIs: 1.15–2.39, $p=0.007$), and in female sufferers 1.22 (95% CIs: 0.57–2.60, $p=0.60$) compared with those without nightmares.

DISCUSSION

This is the first study to report a direct and graded association between the frequency of nightmares and death from suicide in a general population. This association did not reach significance among women probably due to the small number of suicides. Earlier research has implicated that suicidal behavior is related to the frequency of nightmares in a highly selected, small patient group.¹⁴ In addition, we found only one previous population-based study on this issue. Among adolescents aged 13–16 yrs. frequent nightmares were significantly more prevalent in boys and girls having suicidal thoughts compared with those without suicidality.¹⁷

Nightmares experienced at least occasionally were common

Table 2—Means (\pm sd) and proportions (%) of confounding factors by frequency of nightmares (men and women combined)

	FREQUENCY OF NIGHTMARES			P value for trend ¹	
	(N)	Not at all (21,207)	Occasionally (13,479)		Frequently (1,525)
Confounding factors:					
Age (years)		43.3 \pm 10.9	43.1 \pm 11.0	46.3 \pm 10.8	<0.001
Female sex (%)		47.5	55.7	60.7	<0.001
Single, divorced or widowed (%)		22.9	23.4	26.0	0.018
Unemployed (%)		1.7	2.7	4.1	<0.001
Heavy smoking (%)		13.1	13.9	15.8	0.002
Heavy alcohol intake (%)		10.1	13.1	14.0	<0.001
Heavy coffee drinking (%)		22.0	21.6	24.3	n.s.
Irregular physical activity (%)		60.8	61.4	63.5	0.041
Symptoms of insomnia (%)		3.4	9.2	34.3	<0.001
Symptoms of depressed mood (%)		2.2	7.8	34.8	<0.001
Symptoms of life stress (%)		8.5	17.1	47.6	<0.001
Symptoms of anxiety (%)		4.1	12.1	40.6	<0.001
Use of psychotropic medication (%)		5.0	10.9	30.4	<0.001
Very high serum cholesterol (%)		10.5	9.7	14.0	n.s.

¹Mantel-Haenszel test for linear trend

Table 3—Adjusted¹ hazards ratio (with 95% confidence intervals) of suicide according to frequency of nightmares (men and women combined)

Frequency of nightmares	No. of persons	RISK OF SUICIDE		Relative risk (95 % CI's)
		No. of cases		
P				
Not at all	21,207	73	1.00	
Occasionally	13,479	73	1.57 ² (1.12 to 2.19)	0.008
Frequently	1,525	13	2.05 ² (1.06 to 3.97)	0.033
Total	36,211	159		

¹Adjusted hazards ratio computed from coefficients estimated by the Cox proportional hazards regression model and controlled for gender, age, marital status, employment status, smoking, alcohol intake, coffee drinking, physical activity, symptoms of insomnia, depressed mood, life stress and anxiety, psychotropic medication, serum cholesterol concentration, and survey year.

²p=0.0033 for linear trend.

(30%—50%) in our population-based sample. According to earlier studies the prevalence of nightmares have varied from 2% to 75% in adult population samples.^{7,8,18,19,20} The diversity of methodology in defining nightmare and the nightmare frequency, in addition to the different study populations in various cultural settings are the most obvious reasons for the discrepancy of the results. Women in our sample reported a significantly higher prevalence of nightmares than men. This finding is in accordance with previous reports from population studies.^{7,8,18,19} The percentage of those with frequent nightmares increased with age in both genders. However, it is possible that the recall, rather than the actual rate, of nightmares may increase with age, since nocturnal sleep becomes more disrupted with advancing age, which then can make the recall of nightmares more likely.²¹

In this study the frequency of nightmares was directly associated with more frequent symptoms of mental health problems (insomnia, depression, life stress, and anxiety). It has long been recognized that nightmare sufferers are unusually vulnerable, with a potential for mental illness.²² Psychological testing has indicated relatively high levels of psychopathology in subjects with current complaint of nightmares.²³ Bixler and colleagues¹⁹ have shown that individuals with current nightmares needed

more help to deal with tension, problems with alcohol, depression, and loneliness. In another study, insomniac subjects with nightmare problems complained of greater irritability, anxiety, and feelings of depression than the nonnightmare group.⁷ Based on records of long-term antipsychotic medication and/or psychiatric hospital inpatient care, Hublin and his co-workers⁸ showed, that subjects with weekly nightmares had a nearly six-fold risk of having a psychiatric disorder compared with those reporting no nightmares at all.

We estimated the frequency of current (i.e., during the past month) nightmares with only one question, and this may be considered a limitation of this study. The dream logs may yield a higher frequency of nightmares than retrospective reports.²⁴ It has also been suggested that nightmare frequency should be differentiated from nightmare distress.²⁵ However, the reliability and generalization of the results are increased by the large representative sample size, and the long follow-up period.

A difficult challenge facing psychiatrists and clinicians in general practice is the identification of subjects at high risk of suicide. Different clinical features may be observed in people who are going to commit suicide in the near future, in contrast to features observed in persons who may commit suicide years or

decades later.²⁶ The common denominator between the frequency of nightmares and an increased risk of later suicide may be a history of trauma. Earlier research has demonstrated apparent links between history of trauma and attempted suicide,²⁷ between severe trauma and suicidal behavior,²⁸ and between traumatic events and suicidal ideation.²⁹ Furthermore, the experience of a potentially traumatic event (e.g., earthquake,³⁰ childhood abuse,³¹ or war trauma)³² can result in more frequent nightmares. The subjects with frequent nightmares might have failed to psychologically integrate their traumatic experiences.

There is no one approach to prevent suicide.³³ Further studies are needed to incorporate new research findings into the theory and practice of suicide prevention.

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