

**Nocturia is a marker of increased mortality risk:
Results from the Third National Health and Nutrition Examination Survey.**

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Introduction and Objective. Nocturia, a common symptom in both men and women, has been shown to be associated with chronic illnesses such as heart disease and hypertension. Using data from the Third National Health and Nutrition Examination Survey (NHANES III), the objective of this study is to investigate the association of nocturia with subsequent mortality risk.

Methods. NHANES III is a national probability survey of the U.S. conducted between 1988 and 1994. Nocturia was assessed by the question “how many times a night do you usually get up to urinate (pass water)?”. Mortality data was obtained by linkage of the NHANES III to death certificate data found in the National Death Index with follow-up through December 31, 2000. Cox proportional hazards regression models were used to assess the association between nocturia and mortality and to control for the effect of potential confounders and effect modifiers. Analyses were conducted on a sample of 15,988 men and women age 20 and older.

Results. Overall prevalence of nocturia, defined as two or more episodes of urination per night, was 15.5% among men and 20.9% among women, and increased rapidly with age. Multivariate analyses show a statistically significant trend towards increased mortality risk with increased number of voiding episodes among both men and women. Analyses stratified by age groups (<50, 50-64, and 65 and older), show associations of larger magnitudes in the younger age groups with attenuated but statistically significant associations in the oldest age group. Adjustment for heart disease, diabetes, and obesity suggests that the association between nocturia and mortality is only partially explained by those chronic conditions.

Conclusions. Nocturia is a predictor of mortality, more so in relatively younger men and women, rather than in the elderly. Comorbid conditions that are already recognized as being related to nocturia, only partially explain the increased risk of mortality. This suggests that other, unmeasured factors are contributory. Possible candidates include effects of sleep disruption and of other unrecognized comorbid medical conditions.

Association of nocturia and mortality by gender and age. Unadjusted and adjusted hazard ratios (HR) and 95% confidence intervals (95%CI) comparing respondents with nocturia ≥2 to those with nocturia <2 per night.

Age	Men		Women	
	Unadjusted HR (95% CI)	Adjusted HR* (95% CI)	Unadjusted HR (95%CI)	Adjusted HR* (95%CI)
20-49	4.09 (2.20, 7.63)	2.56 (1.32, 4.94)	2.70 (1.53, 4.76)	1.10 (0.66, 1.86)
50-64	2.05 (1.40, 3.02)	1.60 (1.06, 2.41)	2.25 (1.56, 3.25)	1.94 (1.27, 2.96)
65-90	1.65 (1.36, 2.00)	1.35 (1.11, 1.63)	1.54 (1.31, 1.82)	1.19 (1.04, 1.37)
Overall	4.75 (3.95, 5.72)	1.49 (1.25, 1.78)	3.58 (3.05, 4.20)	1.32 (1.14, 1.51)

*Adjusted for age, BMI, marital status, education, smoking, CVD, diabetes, hypertension, medications use (diuretics, antihypertensive, lipid lowering, antidepressants)

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