

WEB MATERIAL

Sleep Duration and Total and Cause-Specific Mortality in a Large US Cohort: Interrelationships With Physical Activity, Sedentary Behavior, and Body Mass Index

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Web Table 1. Association between baseline sleep duration and mortality among healthy ^a participants who reported never napping in the NIH-AARP Diet and Health Study (1995–1996)

	Sleep Duration			
	<5 Hours	5–6 Hours	7–8 Hours	≥9 Hours
All-cause mortality				
No. of deaths	393	4,141	9,132	606
Multivariate RR (95% CI) ^b	1.20 (1.08, 1.33)	1.05 (1.01, 1.09)	Referent	1.14 (1.05, 1.24)
Cardiovascular mortality				
No. of deaths	91	909	1,933	137
Multivariate RR (95% CI) ^b	1.26 (1.02, 1.55)	1.08 (1.00, 1.17)	Referent	1.18 (0.99, 1.40)
Cancer mortality				
No. of deaths	123	1,503	3,614	199
Multivariate RR (95% CI) ^b	1.02 (0.85, 1.22)	0.97 (0.91, 1.03)	Referent	0.99 (0.85, 1.14)

Abbreviations: CI, confidence interval; NIH, National Institutes of Health; RR, relative risk.

^a Defined as reporting fair or better health, and no cancer, heart disease, stroke, or emphysema.

^b Adjusted for sex (male and female), age at baseline (continuous), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, and Asian, Pacific Islander, American Indian/Alaskan Native, or other), marital status (married, widowed, divorced, separated, and never married), education (less than 12 years, 12 years, post high school, some college and college/post graduate), self-reported health (excellent, very good, good, and fair), smoking (never, former and current smoker), smoking dose (0, 1–10, 11–20, 21–30, 31–40, 41–50, 51–60, and >60 cigarettes per day), time since quitting (never quit, ≥10, 5–9, 1–4, <1 years), alcohol drinking (continuous), moderate-to-vigorous physical activity (never, rarely, <1, 1–3, 4–7, and >7 hours/week), television viewing (None, <1, 1–2, 3–4, 5–6, 7–8 and 9+ hours/day), and baseline body mass index (weight (kg)/height (m)²; <18.5, 18.5–<25, 25–<30, 30–<35, 35+).

Web Table 2. Association between baseline sleep duration and mortality, by MVPA, among 239,907 healthy ^a participants in the NIH-AARP Diet and Health Study (1995–1996)

MVPA	Sleep Duration			
	<5 Hours	5–6 Hours	7–8 Hours	≥9 Hours
<i>All-Cause Mortality</i>				
Never<1 hours/week				
No. of deaths	545	4,102	26,513	621
Multivariate ^b RR (95% CI)	1.28 (1.17, 1.40)	1.02 (0.99, 1.06)	Referent	1.20 (1.10, 1.30)
1–3 hours/week				
No. of deaths	318	3,577	6,754	397
Multivariate ^b RR (95% CI)	1.23 (1.10, 1.38)	1.07 (1.02, 1.11)	Referent	1.07 (0.96, 1.18)
≥4 hours/week				
No. of deaths	557	6,451	12,776	705
Multivariate ^b RR (95% CI)	1.13 (1.04, 1.23)	1.06 (1.02, 1.09)	Referent	1.10 (1.02, 1.19)
<i>Cardiovascular Mortality</i>				
Never<1 hours/week				
No. of deaths	181	1,144	2,037	155
Multivariate ^b RR (95% CI)	1.46 (1.25, 1.71)	1.01 (0.94, 1.09)	Referent	1.04 (0.89, 1.23)
1–3 hours/week				
No. of deaths	96	973	1,753	124
Multivariate ^b RR (95% CI)	1.43 (1.16, 1.76)	1.12 (1.03, 1.21)	Referent	1.27 (1.06, 1.53)
≥4 hours/week				
No. of deaths	149	1,681	3,178	164
Multivariate ^b RR (95% CI)	1.18 (1.00, 1.39)	1.09 (1.03, 1.16)	Referent	1.02 (0.87, 1.19)
<i>Cancer Mortality</i>				
Never<1 hours/week				
No. of deaths	159	1,422	2,674	186
Multivariate ^b RR (95% CI)	1.11 (0.94, 1.30)	0.99 (0.93, 1.05)	Referent	1.12 (0.88, 1.18)
1–3 hours/week				
No. of deaths	95	1,267	2,600	138
Multivariate ^b RR (95% CI)	0.99 (0.81, 1.22)	0.99 (0.93, 1.06)	Referent	0.98 (0.83, 1.17)
≥4 hours/week				
No. of deaths	210	2,487	5,140	266
Multivariate ^b RR (95% CI)	1.12 (0.97, 1.28)	1.02 (0.98, 1.07)	Referent	1.06 (0.93, 1.19)

Abbreviations: CI, confidence interval; MVPA, moderate-to-vigorous physical activity; NIH, National Institutes of Health; RR, relative risk.

P for interaction between sleep duration and MVPA: 0.40 for all-cause mortality, 0.51 for cardiovascular mortality, and 0.49 for cancer mortality.

^a Defined as reporting fair or better health, and no cancer, heart disease, stroke, or emphysema.

^b Adjusted for age, sex, race/ethnicity, marital status, education, self-reported health, smoking status, smoking dose, years since quitting smoking, and alcohol drinking.

Web Table 3. Association between baseline sleep duration and mortality, by TV viewing, among 239,907 healthy^a participants in the NIH-AARP Diet and Health Study (1995–1996)

TV Viewing	Sleep Duration			
	<5 Hours	5–6 Hours	7–8 Hours	≥9 Hours
<i>All-Cause Mortality</i>				
None–2 hours/day				
No. of deaths	314	4,034	8,275	473
Multivariate ^b RR (95% CI)	1.26 (1.12, 1.41)	1.06 (1.02, 1.10)	Referent	1.05 (0.95, 1.15)
3–4 hours/day				
No. of deaths	531	6,395	12,243	747
Multivariate ^b RR (95% CI)	1.14 (1.04, 1.24)	1.07 (1.04, 1.10)	Referent	1.18 (1.09, 1.27)
≥5 hours/day				
No. of deaths	575	3,701	6,309	503
Multivariate ^b RR (95% CI)	1.21 (1.11, 1.32)	1.00 (0.96, 1.04)	Referent	1.14 (1.04, 1.25)
<i>Cardiovascular Mortality</i>				
None–2 hours/day				
No. of deaths	69	1,048	2,077	114
Multivariate ^b RR (95% CI)	1.06 (0.83, 1.35)	1.09 (1.01, 1.17)	Referent	0.98 (0.81, 1.18)
3–4 hours/day				
No. of deaths	173	1,720	3,161	181
Multivariate ^b RR (95% CI)	1.39 (1.19, 1.62)	1.10 (1.04, 1.17)	Referent	1.08 (0.93, 1.26)
≥5 hours/day				
No. of deaths	184	1,030	1,730	148
Multivariate ^b RR (95% CI)	1.38 (1.18, 1.61)	1.00 (0.93, 1.08)	Referent	1.22 (1.03, 1.44)
<i>Cancer Mortality</i>				
None–2 hours/day				
No. of deaths	113	1,566	3,392	171
Multivariate ^b RR (95% CI)	1.15 (0.95, 1.39)	1.01 (0.95, 1.08)	Referent	0.96 (0.82, 1.12)
3–4 hours/day				
No. of deaths	170	2,379	4,763	274
Multivariate ^b RR (95% CI)	0.99 (0.85, 1.15)	1.03 (0.98, 1.09)	Referent	1.14 (1.01, 1.29)
≥5 hours/day				
No. of deaths	181	1,231	2,259	145
Multivariate ^b RR (95% CI)	1.15 (0.99, 1.34)	0.95 (0.88, 1.02)	Referent	0.94 (0.79, 1.11)

Abbreviations: CI, confidence interval; NIH, National Institutes of Health; RR, relative risk; TV, television.

P for interaction between sleep duration and TV viewing: 0.16 for all-cause mortality, 0.42 for cardiovascular mortality, and 0.70 for cancer mortality.

^a Defined as reporting fair or better health, and no cancer, heart disease, stroke, or emphysema.

^b Adjusted for age, sex, race/ethnicity, marital status, education, self-reported health, smoking status, smoking dose, years since quitting smoking, and alcohol drinking.