

Title: Nighttime sleep duration, 24-hour sleep duration and risk of all-cause mortality among adults: a meta-analysis of prospective cohort studies

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Table S1 The PRISMA checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	9
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	9-10
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	10
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	9
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	9-10

Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	10
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	10
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	11
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	10-11
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	10-11
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	11
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	10-11
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	3-4
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	3-4
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	4
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	4-5
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	4-5
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	4-5
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	5-6

DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	6-8
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	8-9
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	9
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	12
<p><i>From:</i> Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097</p> <p style="text-align: center;">For more information, visit: www.prisma-statement.org.</p>			

Table S2 characteristics of the studies included in this meta-analysis

Author, year, cohort name, country	Exposure	Mean age (years), sex	Subjects (cases)	Follow-up (years)	RR (95% CI) for each categories of sleep duration	Covariates adjusted
Tsubono et al. 1993, none, Japan ¹	Nighttime sleep	61.4, both	4318 (207)	4	≤6: 1.26 (0.81-1.97) 7-8: 1.00 ≥9: 1.58 (1.16-2.15)	Age and sex
Ruigómez et al. 1995, HISB, Spain ²	24-hour sleep	73.9, both	1219 (224)	5	<7: 0.83 (0.56-1.23) 7-9: 1.00 >9: 1.37 (0.89-2.11)	Age, sex, education level and self-perceived health status
Gale et al. 1998, none, Britain ³	Nighttime sleep	74.0, both	1229 (1158)	23	≤7: 1.0 (0.7-1.4) 8: 0.8 (0.7-1.0) 9: 1.0 10: 1.2 (1.0-1.4) 11: 1.3 (1.0-1.7) ≥12: 1.7 (1.2-2.5)	Age, sex, geriatrician's diagnoses of illness, social class, SBP, and BMI
Kojima, et al. 2000, none, Japan ⁴	Nighttime sleep	M: 46.9 F: 47.7	M: 2438 (149) W: 2884 (109)	11.9	M: ≤6.9: 1.93 (1.12-3.35) 7.0-8.9: 1.00 9.0-9.9: 1.15 (0.74-1.77) ≥10.0: 1.77 (0.88-3.54) W: 0.90 (0.50-1.61) 1.00 1.07 (0.58-1.95) 0.40 (0.06-2.92)	Age, present and past history of hypertension, cerebrovascular, heart and renal diseases and diabetes, and use of sleeping pills (smoking and drinking habits only in males)
Heslop et al. 2002, none, UK ⁵	24-hour sleep	≤65	M: 6022 (2303) W: 1006 (262)	25.0	M: <7: 1.00 (0.89-1.12) 7-8: 1.00 >8: 0.81 (0.67-0.97) W: 0.98 (0.70-1.37) 1.00 1.20 (0.71-2.05)	Age, marital status, current own social class, DBP, blood cholesterol level, BMI, FEV1, hours of recreational exercise per week, units of alcohol consumed each week, number of cigarettes smoked each day

Kripke et al. 2002, CPSII, USA ⁶	Nighttime sleep	M: 58 W: 57	M: 480841 (24523) W: 636095 (59793)	6.0	W: 3: 1.33 (1.08-1.64) 4: 1.11 (1.01-1.22) 5: 1.07 (1.01-1.13) 6: 1.07 (1.03-1.11) 7: 1.00 8: 1.13 (1.09-1.16) 9: 1.23 (1.17-1.28) ≥10: 1.41 (1.34-1.50)	M: 1.19 (0.96-1.47) 1.17 (1.06-1.28) 1.11 (1.05-1.18) 1.08 (1.04-1.11) 1.00 1.12 (1.09-1.15) 1.17 (1.13-1.21) 1.34 (1.28-1.40)	Age, race education, occupation, marital status, exercise level, smoking at intake, years of smoking, churchgoing, fat in diet, fiber in diet, insomnia frequency, health, BMI, leg pain, history of heart disease, hypertension, cancer, diabetes, stroke, respiratory disease, kidney disease and medications
Mallon et al. 2002, none, Sweden ⁷	Nighttime sleep	45-65 (56)	M: 906 (165) W: 964 (101)	12	M: <6: 1.1 (0.6-7.0) 6-8: 1.0 >8: 2.0 (1.2-3.2)	W: 1.0 (0.6-1.8) 1.00 1.3 (0.6-2.6)	Age
Burazeri et al. 2003, KYCHS, Israel ⁸	Nighttime sleep 24-hour sleep	M: 64 W: 63	M: 841 (198) W: 1001 (205)	9-11	M: <6: 1.00 6-8: 1.25 (0.83-1.87) >8: 1.91 (1.16-3.13)	W: 1.00 0.80 (0.54-1.17) 1.08 (0.70-1.66)	Age, social class, country of origin, education, health status, PH of diabetes, CHD, stroke, CHF, smoking, alcohol consumption, physical activity, blood pressure, BMI, glucose, thiocyanate, creatinine, albumin, TC, HDL, homocysteine and siesta (for night sleep)
Amagai, et al. 2004, JMCS, Japan ⁹	Nighttime sleep	M: 55.0 W: 55.2	M: 4419 (289) W: 6906 (206)	8.2	M: ≤5.9: 2.4 (1.3-4.2) 6.0-6.9: 1.1 (0.7-1.8) 7.0-7.9: 1.0 8.0-8.9: 0.9 (0.6-1.2) ≥9.0: 1.1 (0.8-1.6)	W: 0.7 (0.2-2.3) 1.3 (0.8-2.1) 1.0 1.1 (0.8-1.6) 1.5 (1.0-2.4)	Age, SBP, total cholesterol, BMI, smoking habits, alcohol drinking habits, education, and marital status
Patel, et al, 2004, NHS,	24-hour sleep	W: 53.4	82969 (5409)	14.0	≤5: 1.08 (0.96-1.22) 6: 0.99 (0.92-1.06)		Age, smoking status, alcohol consumption, physical activity,

USA ¹⁰					7: 1.00 8: 1.11 (1.03-1.19) ≥9: 1.40 (1.25-1.55)		depression, history of snoring, BMI, history of cancer, cardiovascular disease, hypertension, diabetes and shift-working
Ferrie, 2007, Whitehall II study, UK ¹¹	Nighttime sleep	44.6, both	9871 (566)	17.1	≤5: 1.24 (0.92-1.67) 6: 1.00 (0.82-1.22) 7: 1.00 8: 1.07 (0.84-1.36) ≥9: 1.54 (0.72-3.28)		Age, sex, marital status, employment grade, smoking status, physical activity, alcohol consumption, self-rated health, BMI, SBP, cholesterol, physical illness, modified GHQ score, prevalent CHD
Hubin et al. 2007, Finnish Twin Cohort, Finland ¹²	24-hour sleep	40.7	M: 9529 (1850) W: 10265 (1850)	22.0	M: <7: 1.26 (1.11-1.43) 7-8: 1.00 >8: 1.24 (1.09-1.41)	W: 1.21 (1.05-1.40) 1.00 1.17 (1.03-1.34)	Age, education, marital status, working status, social class, BMI, smoking status, binge drinking, grams of alcohol consumed daily, conditioning physical activity, and life satisfaction
Lan, et al. 2007, SHLSE, Taiwan ¹³	Nighttime sleep	M: 71.3 W: 71.9	M: 1748 (816) W: 1331 (522)	8.4	M: <7: 0.98 (0.76-1.25) 7-7.9: 1.00 8-8.9: 1.09 (0.89-1.33) 9-9.9: 1.14 (0.91-1.42) ≥10: 1.51 (1.19-1.92)	W: 1.14 (0.77-1.67) 1.00 1.36 (1.01-1.84) 1.86 (1.36-2.53) 2.06 (1.50-2.83)	Age, marital status, monthly income, cigarettes smoking, alcohol consumption, BMI, exercise, depression, disease history of heart disease, stroke and cancer, afternoon nap duration
Gangwisch et al. 2008, NHANES I, USA ¹⁴	Nighttime sleep	56.4, both	9789 (1877)	8-10	≤5: 1.17 (0.99-1.39) 6: 0.95 (0.81-1.11) 7: 1.00 8: 1.23 (1.08-1.39) ≥9: 1.34 (1.15-1.56)		Age, sex, physical activity, smoking, depression, education, living alone, low income, daytime sleepiness, nighttime awakening, ethnicity, sleeping pill use, body weight, diabetes, hypertension, general health and cancer

Ikehara et al. 2009, JACC, Japan ¹⁵	Nighttime sleep	M: 58.8 W: 60.2	41489 (8548) 57145 (5992)	14.3	M: ≤4: 1.29 (1.02-1.64) 5: 1.02 (0.90-1.16) 6: 1.08 (1.00-1.16) 7: 1.00 8: 1.06 (1.00-1.12) 9: 1.13 (1.05-1.22) ≥10: 1.41 (1.29-1.54)	W: 1.28 (1.03-1.60) 1.11 (0.98-1.25) 1.05 (0.97-1.14) 1.00 1.16 (1.08-1.24) 1.32 (1.20-1.45) 1.56 (1.40-1.75)	Age, BMI, history of hypertension and diabetes, alcohol consumption, smoking, education level, hours of exercise, hours of walking, regular employment, perceived mental stress, depressive symptoms and frequency of fresh fish intake
Stone, et al. 2009, SOF, USA ¹⁶	Nighttime sleep 24-hour sleep	W: 77.0	8101 (1922)	6.9	Nighttime sleep <6: 1.02 (0.87-1.19) 6-8: 1.00 >8: 1.16 (0.97-1.39)	24-hour sleep <6: 0.95 (0.76-1.18) 6-8: 1.07 (0.94-1.22) 8-9: 1.00 9-10: 1.28 (1.08-1.52) ≥10: 1.58 (1.27-1.95)	Age, BMI, history of at least one medical condition including diabetes mellitus, Parkinson's disease, dementia, chronic obstructive pulmonary disease, non-skin cancer, and osteoarthritis, history of cardiovascular disease, history of hypertension, walks for exercise, alcohol use, smoking status, depression, cognitive impairment, estrogen use, and benzodiazepine use
Suzuki et al. 2009, Shizuoka Study, Japan ¹⁷	Nighttime sleep	74.1	M: 6423 (738) W: 6178 (336)	6	M: ≤5: 1.08 (0.72-1.61) 6: 1.05 (0.75-1.47) 7: 1.00 8: 1.36 (1.04-1.78) 9: 1.52 (1.08-2.15) ≥10: 1.86 (1.34-2.56)	W: 0.71 (0.39-1.29) 1.08 (0.67-1.74) 1.00 1.39 (0.92-2.09) 1.15 (0.64-2.09) 2.27 (1.37-3.76)	Age, BMI, smoking status, alcohol consumption, the frequency of physical activity, socioeconomic status, mental health, hypertension and diabetes mellitus.
Chien et al. 2010, CSCCC, Taiwan ¹⁸	Nighttime sleep	54.8, both	3430 (901)	15.9	≤5: 1.15 (0.90-1.46) 6: 0.97 (0.79-1.21) 7: 1.00		Age, sex, BMI, smoking, current alcohol drinking, marital status, education level, occupation, regular

					8: 1.04 (0.86-1.27) ≥9: 1.34 (1.08-1.67)					exercise, family history of coronary heart disease, hypertension, diabetes, cholesterol, HDL, triglyceride, glucose, and uric acid level
Mesas, et al. 2010, Spain ¹⁹	24-hour sleep	71.8	1673 (452) 2147 (445)	6.8	M: ≤6: 1.16 (0.77-1.73) 7: 1.00 8: 1.52 (1.04-2.20) 9: 1.55 (1.04-2.30) ≥10: 1.93 (1.32-2.81)	W: 1.52 (1.03-2.23) 1.00 1.21 (0.81-1.88) 1.48 (0.99-2.23) 1.67 (1.14-2.44)				Age, BMI, educational level, municipality of residence, physical activity, smoking, alcohol consumption, coffee consumption, social links, perceived health, MEC score, depression, SF-36 PCS and MCS scores, IADL limitations, hypertension, ischemic heart disease, stroke, diabetes mellitus, cancer at any site, chronic obstructive pulmonary disease, Parkinson's disease, arousal from sleep at night, and use of anxiolytic medication
Castro-Costa et al. 2011, Bambur' Cohort Study, Brazil ²⁰	Nighttime sleep	68.9, both	1512 (440)	9	<6: 1.09 (0.78-1.53) 6-7: 0.84 (0.60-1.17) 7-8: 1.00 8-9: 1.31 (0.97-1.78) ≥9: 1.53 (1.12-2.09)					Age, sex, schooling marital status, working status, education, alcohol consumption, coffee consumption, smoking, physical exercises, apnoea, depressive symptoms, cognitive functioning, psychoactive medications, physical functioning, arthritis ascertainment, SBP, HDL cholesterol ratio, diabetes mellitus and BMI
Cohen-Mansfield et al. 2012,	Nighttime sleep	83.4, both	1166 (1108)	20	<7: 0.98 (0.84-1.13) 7-9: 1.00					Age, sex, country of origin, education, financial status, and

CALAS, Israel ²¹					>9: 1.32 (1.09-1.58)		having children, married, No. of medications, comorbidity, subjective health, ADL limitations, IADL limitations, cognitive difficulties, depressed affect
Chen et al. 2013, Shih-Pai Sleep Study Taiwan ²²	Nighttime sleep	73.8, both	4064 (1004)	9	≤4: 1.00 (0.75-1.33) 5: 0.92 (0.74-1.15) 6: 0.88 (0.73-1.06) 7: 1.00 8: 1.26 (1.04-1.53) ≥9: 1.66 (1.28-2.17)		Sex, age, living status, marital status, education, BMI, insomnia, excessive daytime sleepiness, pain, smoking, alcohol drinking, snorers, diabetes mellitus, hypertension, cardiovascular disease, stroke, gouty arthritis, depression and hypnotics
Garde et al. 2013, Copenhagen Male Study, Denmark ²³	Nighttime sleep	48.6, M	5249 (2663)	30	<6: 1.06 (0.90-1.25) 6-7: 1.00 ≥8: 0.99 (0.84-1.09)		Age, BMI, SBP, DBP, diabetes, hypertension, physical fitness, alcohol use, smoking, leisure-time physical activity, and social class
Jung et al. 2013, None, USA ²⁴	Nighttime sleep	M: 74.1 W: 73.3	M: 889 (632) W: 1112 (592)	19	M: <6: 0.98 (0.67-1.43) 6-6.9: 1.12 (0.85-1.48) 7-7.9: 1.00 8-8.9: 0.98 (0.79-1.22) ≥9: 1.09 (0.82-1.45)	W: 1.11 (0.77-1.60) 1.17 (0.85-1.61) 1.00 1.19 (0.90-1.57) 1.51 (1.05-2.18)	Age, nap duration, Beck Depression Inventory (only in men), education (only in men), exercise (only in men), smoking (only in women), alcohol consumption, and medical history of hypertension, diabetes, coronary heart disease, stroke, cancer, sleep-related medications and postmenopausal estrogen (only in women)
Kakizaki et al. 2013, Ohsaki Cohort Study,	24-hour sleep	60.3, both	49256 (8447)	10.8	≤6: 1.01 (0.93-1.09) 7: 1.00 8: 1.07 (1.01-1.14)		Age, sex, total caloric intake, BMI, marital status, level of education, job status, history of myocardial

Japan ²⁵					9: 1.14 (1.06-1.24) ≥10: 1.37 (1.27-1.47)		infarction, history of cancer, stroke, hypertension and diabetes mellitus; smoking status, alcohol drinking, time spent walking, perceived mental stress, self-rated health, physical function
Kim et al. 2013, Multiethnic Cohort Study, USA ²⁶	24-hour sleep	40-75 (66)	M: 61936 (10738) W: 73749 (8597)	12.9	M: ≤5: 1.15 (1.06-1.23) 6: 1.04 (0.99-1.10) 7: 1.00 8: 1.07 (1.01-1.12) ≥9: 1.19 (1.12-1.27)	W: 1.14 (1.06-1.23) 1.05 (0.99-1.12) 1.00 1.02 (0.96-1.08) 1.22 (1.13-1.31)	Age, ethnicity, education, marital status, history of hypertension or diabetes at enrollment, alcohol consumption, energy intake, BMI, physical activity, hours spent daily watching television, and smoking history
Li et al. 2013, SAKUCESS, Japan ²⁷	Nighttime sleep	M: 57.7 W: 52.6	M: 4770 (181) W: 7719 (131)	7	M: ≤5: 1.44 (0.65-3.19) 6: 0.86 (0.50-1.48) 7: 1.00 8: 1.05 (0.72-1.53) ≥9: 1.70 (1.07-2.70)	W: 1.01 (0.42-2.39) 1.31 (0.78-2.21) 1.00 1.01 (0.63-1.60) 1.85 (1.09-3.13)	Age, BMI, SBP, DBP, smoking status, drinking habits and physical activity
Magee et al. 2013, 45 and Up Study, Australia ²⁸	24-hour sleep	61.5, both	227815 (8782)	2.8	<6: 1.13 (1.01-1.25) 6: 0.99 (0.91-1.06) 7: 1.00 8: 1.02 (0.96-1.08) 9: 1.04 (0.96-1.12) ≥10: 1.26 (1.16-1.36)		Age, gender, marital status, private health insurance, smoking status, alcohol consumption, BMI, sufficient physical activity, and baseline health status
Yeo et al. 2013, KMCC, Korea ²⁹	24-hour sleep	54.9, both	13164 (1580)	9.44	≤5: 1.21 (1.03-1.41) 6: 1.10 (0.95-1.27) 7: 1.00 8: 1.03 (0.89-1.19)		Age, sex, educational attainment, BMI, cigarette smoking, alcohol consumption, past history of hypertension, type 2 diabetes, CVD,

					9: 1.36 (1.11-1.67) ≥10: 1.36 (1.07-1.72)		and metabolic syndrome
Bellavia et al. 2014, CSM and SMC, Sweden ³⁰	Nighttime sleep	60.2, both	70973 (14575)	15	<6: 1.25 (1.13-1.37) 6-6.5: 1.10 (1.04-1.17) 6.6-7.4: 1.00 7.5-8: 1.03 (0.98-1.08) >8: 1.14 (1.05-1.24)		Sex, age, BMI, smoking status and pack-years of smoking, alcohol consumption, educational level and physical activity
Cai et al. 2014, SWMHS, China ³¹	24-hour sleep	M: 55.2 W: 52.4	M: 44590 (1921) W: 68548 (2356)	M: 6.07 W: 7.12	M: 4-5: 1.06 (0.90-1.25) 6: 1.07 (0.94-1.23) 7: 1.00 8: 1.13 (1.00-1.28) 9: 1.34 (1.10-1.62) ≥10: 1.55 (1.29-1.86)	W: 1.15 (1.01-1.32) 1.06 (0.94-1.20) 1.00 1.17 (1.04-1.32) 1.36 (1.13-1.64) 2.11 (1.77-2.52)	Age, education, income, smoking, alcohol consumption, tea consumption, comorbidity score, history of nightshift work, participation in regular exercise, BMI, and WHR
Rod, et al. 2014, Whitehall II study, UK ³²	Nighttime sleep	M: 43.9 W: 45.1	M: 6114 (538) W: 2984 (266)	22	M: ≤5: 1.11 (0.73-1.68) 6: 1.23 (1.01-1.50) 7: 1.00 8: 1.18 (0.92-1.50) >9: 1.44 (0.59-3.50)	W: 1.21 (0.76-1.91) 1.14 (0.86-1.52) 1.00 0.91 (0.63-1.30) 1.48 (0.60-3.65)	Age, employment grade, ethnicity, and marital status
Xiao et al. 2014, NIH-AARP Diet and Health Study, USA ³³	24-hour sleep	62.5, both	239896 (44100)	14	24-hour sleep <5: 1.16 (1.10-1.23) 5-6: 1.04 (1.02-1.06) 7-8: 1.00 ≥9: 1.11 (1.06-1.19)	Nighttime sleep 1.20 (1.08-1.33) 1.05 (1.01-1.09) 1.00 1.14 (1.05-1.24)	Sex, age, race/ethnicity, marital status, education, self-reported health, smoking, smoking dose, years since quitting smoking, alcohol drinking, MVPA, television viewing, and BMI
Hall et al. 2015, Health ABC, USA ³⁴	Nighttime sleep	73.6, both	3075 (953)	8.2	<6: 1.06 (0.83-1.34) 6: 1.00 (0.82-1.22) 7: 1.00 8: 1.10 (0.91-1.33)		Age, gender, race, inflammatory markers (TNF-a, IL6, CRP), education, BMI, alcohol, smoking status, physical activity, study site

					>8: 1.23 (0.93-1.63)	Pittsburgh, arthritis, diabetes, depression, CHD, corticosteroid use, anti-inflammatory use
Zuurbier et al. 2015, Rotterdam Study, The Netherlands ³⁵	Nighttime sleep	62.2, both	1734 (154)	7.3	<6: 1.41 (0.93-2.13) 6-7.5: 1.00 >7.5: 1.10 (0.74-1.64)	Age, sex, activities of daily living score, current smoking, diabetes, myocardial infarction, stroke, cognitive functioning, depressive symptoms, BMI, sleep medication, napping, and apnea

BMI: body mass index, CALAS: Cross-Sectional and Longitudinal Aging Study, CHD: coronary heart disease, CSCCC: Chin-Shan Community Cardiovascular Cohort study, CSM and SMC: Cohort of Swedish Men and the Swedish Mammography Cohort, HDL: high-density lipoprotein, HISB: Health Interview Survey of Barcelona, IADL: instrumental activity of daily living limitations, KMCC: Korean Multi-center Cancer Cohort study, KYCHS: Kiryat Yovel Community Health Study, MCS: Mental Component Summary, MEC: Mini-Examen Cognoscitivo score, MVPA, moderate-to-vigorous physical activity, PCS: Physical Component Summary, SF-36: Medical Outcomes Study 36-item Short Form Survey, SHLSE: Survey of Health and Living Status of the Elderly, SOF: Study of Osteoporotic Fractures, SWMHS: Shanghai Women's and Men's Health Studies

Table S3 Summary of the included studies and results from meta-regression

	Nighttime sleep				24-hour sleep ^b			
	N ^a	Participants	References	P ^c	N ^a	Participants	References	P ^c
Overall	36	1,526,609	1,3-4,6-9,11,13-18,20-24,27,30,32-35		19	903,727	2,5,8,10,12,16,19,25-26,28-29,31,33	
Subjects without cardiovascular diseases and cancer at baseline	10	329,420	9,15,27,30,32-33		4	341,530	26,28,31	
Country				0.16				0.05
Asia	18	158,270	1,4,8-9,13,15,17-18,21-22,27		6	177,400	8,25,29,31	
Europe	9	100,024	3,7,11,23,30,32,35		7	31,861	2,5,12,19	
USA	9	1,268,315	6,14,16,20,24,33-34		5	466,651	10,16,26,33	
Sex				0.27				0.35
Men	12	556,127	4,6-9,13,15,17,23-24,27,32		6	124,591	5,8,12,19,26,31	
Women	12	732,420	4,6-9,13,15-17,24,27,32		8	247,786	5,8,10,12,16,19,26,31	
Both	12	238,062	1,3,11,14,18,20-22,30,33-35		5	531,350	2,25,28-29,33	
Mean age				0.74				0.32
>60 years	19	299,741	1,3,8,13,15-17,20-22,24,30,33-35		11	667,634	The others	
≤60 years	17	1,226,868	The others		8	236,093	5,10,12,29,31	
Follow-up duration				0.22				0.05
≥10 years	20	347,375	3-4,7-8,11,14-15,18,21,23-24,30,32		11	536,470	The others	

<10 years	16	1,179,234	The others	8	367,257	2,16,19,29,31	
Sleep assessment				0.55			0.08
Self-administered	21	1,468,468	1,4,6-8,11,15-17,24,30,32-33	15	776,206	The others	
Interviewer-administered	15	58,141	The others	4	127,521	2,29,31	
Adjusted for ...				0.40			0.97
Education/socioeconomic status							
Yes	27	1,492,775	The others	17	812,657	The others	
No	9	33,834	1,4,7,16,27,35	2	91,070	10,16	
Smoking				0.90			0.61
Yes	28	1,506,044	The others	18	902,508	The others	
No	8	20,565	1,3-4,7,21,32	1	1,219	2	
Alcohol				0.89			0.61
Yes	24	377,585	The others	18	902,508	The others	
No	12	1,149,024	1,3-4,6-7,14,21,32,35	1	1,219	2	
Physical activity				0.95			0.83
Yes	25	1,489,383	The others	17	889,344	The others	
No	11	37,226	1,3-4,7,9,22,32	2	14,383	2,29	
Health status ^d				0.48			0.21
Yes	10	1,273,266	6,8,11,14,20-21,23,33	10	530,876	The others	
No	26	253,343	The others	9	372,851	10,12,16,26,29,31	
Blood pressure				0.77			0.52
Yes	22	1,291,906	The others	12	301,865	The others	

No	14	234,703	1,7,13,21,27,30,32-35	7	601,862	2,12,28,31,33	
Body mass index				0.83			0.61
Yes	26	1,502,834	The others	18	902,508	The others	
No	10	23,775	1,4,7,21,24,32	1	1,219	²	
Preexisting chronic diseases				0.22			0.42
Yes	32	1,518,909	The others	14	875,686	The others	
No	4	7,700	1,7, ²⁰	5	28,041	2,5,12	
Sleep disorders/ siesta				0.74			0.20
Yes	13	1,158,,557	4,6,14,16,20,22,24,32,35	6	96,732	8,10,16,19	
No	23	368,052	The others	13	806,995	The others	
Depression/ mental health				0.44			0.23
Yes	15	145,756	13-17,20-22,24,34-35	5	144,146	10,16,19,25	
No	21	1,380,853	The others	14	759,581	The others	
Study quality				0.40			0.51
7-8 stars	13	339,040	3,11,15,18,21,23,27,30,32-33	10	653,902	10,12,25-26,29,31,33	
4-6 stars	23	1,187,569	The others	9	249,825	The others	

a: N: number of studies (gender-specific studies).

b: there is a study conducted in Australia.

c: P values from meta-regression with a permute test of 1000.

d: health status (self-reported health status or physical functioning)

The search syntax is as follows: ((((((prospective) OR cohort) OR longitudinal) OR follow-up)) AND ((death) OR mortality)) AND sleep), without restrictions. The titles/abstracts of the articles were screened for the following inclusion criteria: sleep duration and all-cause mortality as the potential exposure and outcome of interest, conducted in humans and adults, prospective cohort studies and original articles.

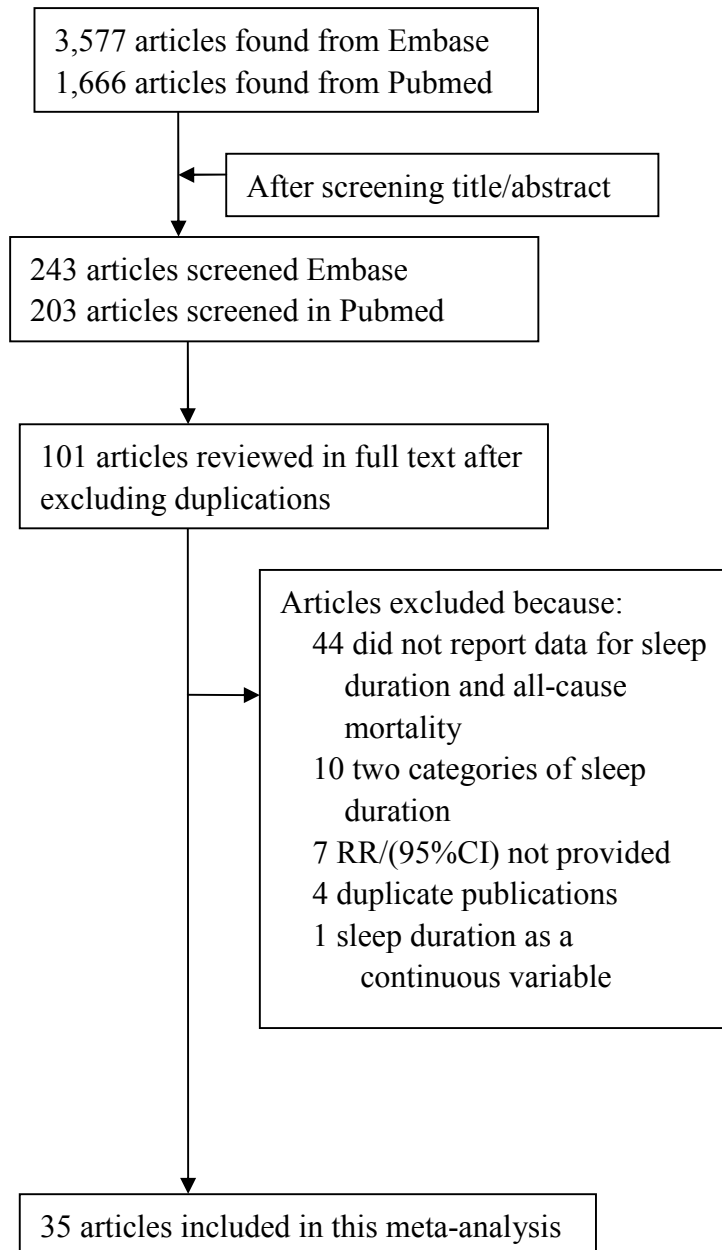


Figure S1 The flow chart for detailed steps of literature search

The following papers were excluded because of: two categories of sleep duration³⁶⁻⁴⁵, RR/(95%CI) not provided⁴⁶⁻⁵², duplicate publications⁵³⁻⁵⁴, and sleep duration as a continuous variable⁵⁵.

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