

Supplementary Table S1. The characteristics of total surveyed subjects in 2011

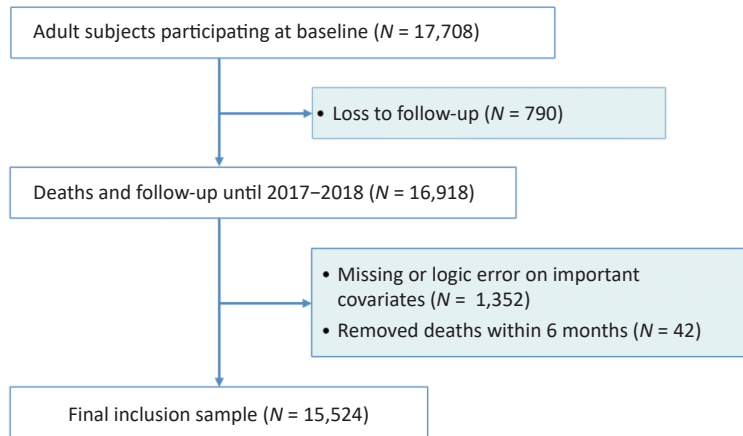
| Variables | Value |
|--|---------------|
| Total surveyed subjects, <i>n</i> | 17,708 |
| Demographic characteristics | |
| Age, years | 59.1 ± 10.1 |
| Male, % | 48.5 |
| Married, % | 80.4 |
| Urban, % | 46.4 |
| North, % | 54.5 |
| Educational attainment, % | |
| Illiteracy | 23.8 |
| 1–6 years | 40.2 |
| 7–9 years | 23.3 |
| > 9 years | 12.7 |
| Behavioral factors | |
| Smoking status, % | |
| Current | 30.2 |
| Former | 6.3 |
| Never | 63.5 |
| Alcohol consumption, % | |
| Current | 16.0 |
| Former | 4.6 |
| Never | 79.4 |
| Nighttime sleep, % | |
| < 6 hours/night | 23.3 |
| 6 – < 8 hours/night | 40.5 |
| ≥ 8 hours/night | 36.2 |
| Health status | |
| BMI, kg/m ² | 23.3 ± 3.4 |
| Chronic diseases, % | 14.6 |
| Depressive status, % | 37.2 |

Note. Data are presented using mean ± SD for continuous variables and percentages for categorical variables. The sum of percentages from multiple subgroups may not equal 100% exactly due to rounding-off numbers. BMI, body-mass index.

Supplementary Table S2. Relative excess risk (95% *CI*) and attributable proportion (95% *CI*) due to interaction of midday napping and nighttime sleep on all-cause mortality

| Variable | RERI (95% <i>CI</i>) | AP (95% <i>CI</i>) |
|-----------------------|-----------------------------|-----------------------------|
| | Adjusted model ^a | Adjusted model ^a |
| Midday napping, < 6 h | −0.074 (−0.412, 0.264) | −0.053 (−0.296, 0.190) |
| Midday napping, > 8 h | −0.199 (−0.554, 0.156) | −0.137 (−0.387, 0.112) |

Note. ^aWe adjusted gender, age, BMI, marital status, residential region, education attainment, social activity, smoking status, alcohol consumption and chronic disease. 95% *CI*: 95% confidence interval.



Supplementary Figure S1. Inclusion and exclusion flow chart of study sample.

Supplementary Table S3. Subgroup analysis for association of napping duration with all-cause mortality

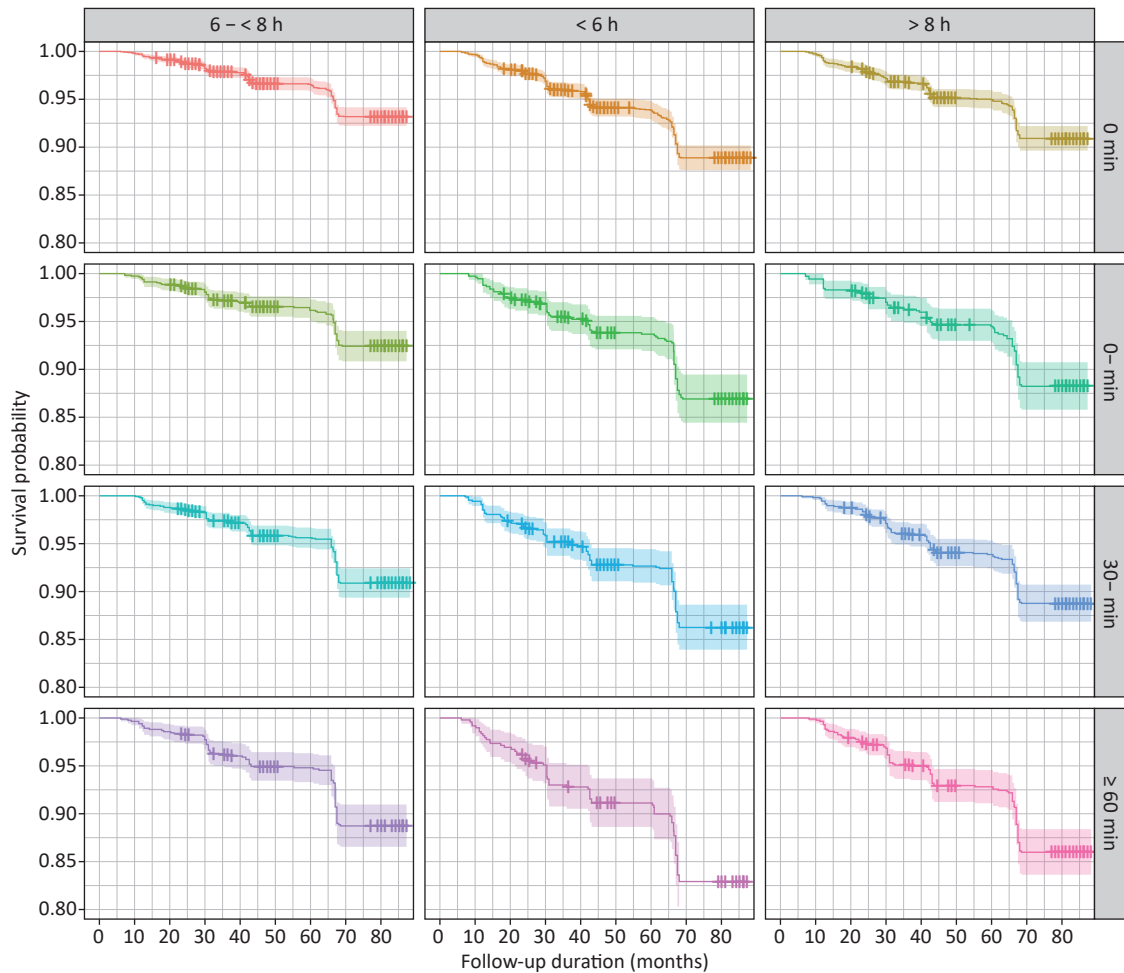
| Subgroup | Hazard ratio ^a [95% CI] | | | P for trend | P for interaction |
|------------------------|------------------------------------|--------------------------|----------------------------|-------------|-------------------|
| | 0– min | 30– min | ≥ 60 min | | |
| Gender | | | | | 0.473 |
| Male | 1.03 [0.84–1.27] | 1.05 [0.88–1.26] | 1.19 [0.98–1.44] | 0.102 | |
| Female | 1.16 [0.90–1.48] | 1.24 [0.99–1.56] | 1.52 [1.17–1.97]** | 0.001 | |
| Age, years | | | | | 0.760 |
| 45–64 | 1.03 [0.79–1.34] | 1.23 [0.98–1.55] | 1.28 [0.98–1.66] | 0.029 | |
| ≥ 65 | 1.15 [0.95–1.40] | 1.09 [0.91–1.31] | 1.32 [1.09–1.59]** | 0.011 | |
| BMI, kg/m ² | | | | | 0.701 |
| < 24 | 1.07 [0.89–1.28] | 1.13 [0.96–1.33] | 1.20 [1.00–1.44] | 0.034 | |
| ≥ 24 | 1.15 [0.84–1.58] | 1.14 [0.86–1.53] | 1.54 [1.15–2.06]** | 0.009 | |
| Residential region | | | | | 0.662 |
| Urban | 0.95 [0.74–1.23] | 1.10 [0.87–1.39] | 1.19 [0.92–1.56] | 0.154 | |
| Rural | 1.16 [0.95–1.41] | 1.15 [0.96–1.37] | 1.35 [1.12–1.64]** | 0.003 | |
| Geolocation | | | | | 0.289 |
| North | 1.23 [0.98–1.55] | 1.16 [0.93–1.44] | 1.41 [1.12–1.78]** | 0.007 | |
| South | 0.94 [0.76–1.18] | 1.12 [0.93–1.34] | 1.18 [0.95–1.47] | 0.090 | |
| Smoking status | | | | | 0.094 |
| No | 1.04 [0.83–1.31] | 1.27 [1.03–1.56]* | 1.59 [1.26–2.00]*** | < 0.001 | |
| Yes | 1.12 [0.90–1.39] | 1.03 [0.85–1.25] | 1.11 [0.91–1.37] | 0.396 | |
| Alcohol consumption | | | | | 0.524 |
| No | 1.10 [0.90–1.34] | 1.23 [1.03–1.47]* | 1.41 [1.15–1.73]*** | < 0.001 | |
| Yes | 1.04 [0.80–1.36] | 1.00 [0.80–1.26] | 1.16 [0.91–1.47] | 0.350 | |

Note. ^aWe adjusted gender, age, BMI, marital status, residential region, education attainment, social activity, smoking status, alcohol consumption and chronic disease. 95% CI: 95% confidence interval. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Supplementary Table S4. Subgroup analysis for association of nighttime sleep duration with all-cause mortality

| Subgroup | Hazard ratio ^a [95% CI] | | | P for trend | P for interaction |
|------------------------|--------------------------------------|---------------|---------------------------------------|-------------|-------------------|
| | < 6 hours | 6 – < 8 hours | ≥ 8 hours | | |
| Gender | | | | | 0.086 |
| Male | 1.16 [0.98–1.38] | 1 (Ref) | 1.15 [0.97–1.36] | 0.944 | |
| Female | 1.28 [1.02–1.60][*] | 1 (Ref) | 1.50 [1.20–1.88]^{**} | 0.944 | |
| Age, years | | | | | 0.454 |
| 45–64 | 1.28 [1.02–1.60][*] | 1 (Ref) | 1.31 [1.06–1.63][*] | 0.729 | |
| ≥ 65 | 1.19 [1.00–1.41][*] | 1 (Ref) | 1.23 [1.04–1.47][*] | 0.687 | |
| BMI, kg/m ² | | | | | 0.807 |
| < 24 | 1.22 [1.04–1.43][*] | 1 (Ref) | 1.25 [1.07–1.47]^{**} | 0.776 | |
| ≥ 24 | 1.13 [0.86–1.49] | 1 (Ref) | 1.27 [0.99–1.65] | 0.342 | |
| Residential region | | | | | 0.333 |
| Urban | 1.19 [0.95–1.48] | 1 (Ref) | 1.39 [1.11–1.72]^{**} | 0.185 | |
| Rural | 1.21 [1.02–1.43][*] | 1 (Ref) | 1.18 [1.00–1.41] | 0.800 | |
| Geolocation | | | | | 0.470 |
| North | 1.14 [0.93–1.41] | 1 (Ref) | 1.27 [1.05–1.54][*] | 0.250 | |
| South | 1.26 [1.05–1.51][*] | 1 (Ref) | 1.24 [1.03–1.49][*] | 0.741 | |
| Smoking status | | | | | 0.091 |
| No | 1.31 [1.07–1.61]^{**} | 1 (Ref) | 1.44 [1.18–1.77]^{***} | 0.367 | |
| Yes | 1.11 [0.92–1.33] | 1 (Ref) | 1.13 [0.94–1.36] | 0.798 | |
| Alcohol consumption | | | | | 0.885 |
| No | 1.15 [0.97–1.36] | 1 (Ref) | 1.25 [1.06–1.48]^{**} | 0.323 | |
| Yes | 1.32 [1.05–1.64][*] | 1 (Ref) | 1.30 [1.04–1.63][*] | 0.936 | |

Note. ^aWe adjusted gender, age, BMI, marital status, residential region, education attainment, social activity, smoking status, alcohol consumption and chronic disease. 95% CI: 95% confidence interval. ^{*}*P* < 0.05; ^{**}*P* < 0.01; ^{***}*P* < 0.001.



Supplementary Figure S2. Kaplan–Meier survival curves stratified by midday napping and nighttime sleep duration.

Supplementary Table S5. Associations of midday napping and nighttime sleep duration with all-cause mortality in the CHARLS after excluding participants who died within the first year from the baseline interview

| Exposures | Groups | Gender- and age-adjusted model | | | Multivariable-adjusted model ^a | | |
|-------------------------|---------|--------------------------------|-------------------|-------------|---|-------------------|-------------|
| | | HR [95% CI] | P for association | P for trend | HR [95% CI] | P for association | P for trend |
| Midday napping (min) | | | | < 0.001 | | | < 0.001 |
| | 0 | 1 (Ref) | | | 1 (Ref) | | |
| | 0– | 1.09 [0.94–1.27] | 0.261 | | 1.10 [0.94–1.29] | 0.254 | |
| | 30– | 1.16 [1.01–1.33] | 0.035 | | 1.15 [0.99–1.33] | 0.062 | |
| | ≥ 60 | 1.35 [1.17–1.57] | < 0.001 | | 1.30 [1.11–1.52] | 0.001 | |
| Nighttime sleep (hours) | | | | 0.222 | | | 0.450 |
| | < 6 | 1.35 [1.19–1.54] | < 0.001 | | 1.17 [1.02–1.34] | 0.028 | |
| | 6 – < 8 | 1 (Ref) | | | 1 (Ref) | | |
| | ≥ 8 | 1.25 [1.10–1.43] | < 0.001 | | 1.23 [1.07–1.42] | 0.003 | |

Note. ^aMultivariable-adjusted model: We adjusted gender, age, BMI, marital status, residential region, education attainment, social activity, smoking status, alcohol consumption, and chronic disease. HR: hazard ratio; CI: confidence interval.

Supplementary Table S6. Associations of midday napping and nighttime sleep duration with all-cause mortality after adding health insurance variables to the multivariable-adjusted model

| Exposures | Groups | Gender- and age-adjusted model | | | Multivariable-adjusted model ^a | | |
|-------------------------|---------|-----------------------------------|-------------------|-------------|---|-------------------|-------------|
| | | HR [95% CI] | P for association | P for trend | HR [95% CI] | P for association | P for trend |
| Midday napping (min) | | | | < 0.001 | | | < 0.001 |
| | 0 | 1 (Ref) | | | 1 (Ref) | | |
| | 0– | 1.08 [0.93–1.25] | 0.327 | | 1.07 [0.91–1.26] | 0.352 | |
| | 30– | 1.15 [1.00–1.31] | 0.048 | | 1.12 [0.98–1.30] | 0.076 | |
| | ≥ 60 | 1.35 [1.17–1.56] | < 0.001 | | 1.30 [1.12–1.52] | 0.001 | |
| Nighttime sleep (hours) | | | | 0.121 | | | 0.552 |
| | < 6 | 1.39 [1.23–1.57] | < 0.001 | | 1.21 [1.06–1.39] | 0.007 | |
| | 6 – < 8 | 1 (Ref) | | | 1 (Ref) | | |
| | ≥ 8 | 1.26 [1.11–1.43] | < 0.001 | | 1.26 [1.10–1.45] | 0.001 | |

Note. ^aMultivariable-adjusted: We adjusted gender, age, BMI, marital status, residential region, education attainment, social activity, smoking status, alcohol consumption, health insurance, and chronic disease. *HR*: hazard ratio; *CI*: confidence interval.

Supplementary Table S7. Descriptive analysis for the prevalence of pre-existing chronic diseases by midday napping and nighttime sleep duration

| Exposures | Groups | Cardiovascular disease, % | | Respiratory disease, % | | Diabetes, % | | Depression status, % | |
|-------------------------|----------|---------------------------|------|------------------------|------|-------------|------|----------------------|------|
| | | Yes | No | Yes | No | Yes | No | Yes | No |
| | Total, % | 34.4 | 65.6 | 11.6 | 88.4 | 5.6 | 94.4 | 37.3 | 62.7 |
| Midday napping (min) | | | | | | | | | |
| | 0 | 31.0 | 69.0 | 11.4 | 88.6 | 4.3 | 95.7 | 40.8 | 59.2 |
| | 0– | 39.2 | 60.8 | 11.2 | 88.8 | 7.2 | 92.8 | 35.2 | 64.8 |
| | 30– | 37.1 | 62.9 | 12.4 | 87.6 | 6.8 | 93.2 | 34.5 | 65.5 |
| | ≥ 60 | 37.8 | 62.2 | 12.5 | 87.5 | 6.4 | 93.6 | 32.6 | 67.4 |
| Nighttime sleep (hours) | | | | | | | | | |
| | < 6 | 39.0 | 61.0 | 15.7 | 84.3 | 6.4 | 93.6 | 57.1 | 42.9 |
| | 6 – < 8 | 33.4 | 66.6 | 10.2 | 9.8 | 5.7 | 94.3 | 30.0 | 70.0 |
| | ≥ 8 | 32.2 | 67.8 | 9.9 | 90.1 | 4.9 | 95.1 | 27.7 | 72.3 |