

Supplementary Table 1. Detailed description of the 32 items used to construct the frailty index and their corresponding cut-off values.

No	Description of the items	Cut-off value
	CHARLS	
1	Self-reported physician diagnosed hypertension	Yes = 1, No = 0
2	Self-reported physician diagnosed diabetes	Yes = 1, No = 0
3	Self-reported physician diagnosed heart disease	Yes = 1, No = 0
4	Self-reported physician diagnosed stroke	Yes = 1, No = 0
5	Self-reported physician diagnosed cancer	Yes = 1, No = 0
6	Self-reported physician diagnosed arthritis	Yes = 1, No = 0
7	Self-reported physician diagnosed chronic lung disease	Yes = 1, No = 0
8	Self-reported physician diagnosed asthma	Yes = 1, No = 0
9	Self-reported physician diagnosed any emotional, nervous, or psychiatric problems	Yes = 1, No = 0
10	Self-reported physician diagnosed memory-related disease	Yes = 1, No = 0
11	Self-reported vision problems	Yes = 1, No = 0 in the CHARLS
12	Self-reported hearing problems	Yes = 1, No = 0 in the CHARLS
13	Self-reported general health status	Poor or fair = 1, excellent, very good, or good = 0
14	Difficulty with dressing	Yes = 1, No = 0
15	Difficulty with bathing or showering	Yes = 1, No = 0
16	Difficulty with eating	Yes = 1, No = 0
17	Difficulty with getting in and out of bed	Yes = 1, No = 0
18	Difficulty with using the toilet	Yes = 1, No = 0
19	Difficulty with managing money	Yes = 1, No = 0

20	Difficulty with taking medications	Yes = 1, No = 0
21	Difficulty with shopping for groceries	Yes = 1, No = 0
22	Difficulty with preparing meals	Yes = 1, No = 0
23	Difficulty with doing housework	Yes = 1, No = 0
24	Mobility: difficulty with walking 100 yards	Yes = 1, No = 0
25	Mobility: difficulty with getting up from a chair after sitting for long periods	Yes = 1, No = 0
26	Mobility: difficulty with climbing several flights of stairs without resting	Yes = 1, No = 0
27	Mobility: difficulty with lifting or carrying weights over 10 pounds/jins	Yes = 1, No = 0
28	Mobility: difficulty with picking up a coin from the table	Yes = 1, No = 0
29	Mobility: difficulty with stooping, kneeling, or crouching	Yes = 1, No = 0
30	Mobility: difficulty with reaching arms above shoulder level	Yes = 1, No = 0
31	Depression: CESD-10 questionnaire	CESD-10 >10 =1, ≤10 =0 in the CHARLS
32	Cognition: (memory test score + orientation test score) / 14	Continuous, ranging from 0 to 1

Heart disease indicates the angina, coronary heart disease, congestive heart failure, or other heart problems.

Memory-related disease indicates Alzheimer's disease or dementia, organic brain senility, or other serious memory impairment.

Depression is evaluated using Center for Epidemiologic Studies Depression Scale (CESD). In the CHARLS, CESD-10 is used, and the total score ranges from 0 to 30. The higher score indicates more severe depressive symptoms.

The memory score is the average of words that are not recalled in the immediate and delayed word recall tasks. The memory score ranges from 0 to 10. The orientation test comprises four questions about the day of the week, the month, the date of the month, and the year. One point is given for each wrong answer, and the range is from 0 to 4.

Supplementary Table 2. Subgroup and interaction analyses of the association between sleep duration and frailty.

Subgroup	Q3	Q1 vs Q3	<i>P</i> value	Q2 vs Q3	<i>P</i> value	Q4 vs Q3	<i>P</i> value	<i>p</i> for interaction
Linear regression								
Age								0.29
45–59	<i>Ref.</i>	0.19(0.16, 0.21)	<0.001	0.06(0.04, 0.08)	<0.001	0.04(0.01, 0.07)	0.02	
≥60	<i>Ref.</i>	0.18(0.15, 0.22)	<0.001	0.02(-0.02, 0.06)	0.24	0.05(0.00, 0.10)	0.05	
Logistic regression								
Age								0.48
45–59	<i>Ref.</i>	2.51(1.72,3.70)	<0.001	1.30(0.80,2.08)	0.28	1.52(0.79,2.73)	0.18	
≥60	<i>Ref.</i>	1.90(1.53,2.38)	<0.001	1.02(0.76,1.36)	0.87	1.62(1.15,2.25)	0.005	

All models were adjusted for gender, education, marital status, residential area, BMI, smoking, drinking, hypertension, diabetes.