

Supplemental Online Content

Tse LA, Wang C, Rangarajan S, et al. Timing and length of nocturnal sleep and daytime napping and associations with obesity types in high-, middle-, and low-income countries. *JAMA Netw Open*. 2021;4(6):2113775. doi:10.1001/jamanetworkopen.2021.13775

eFigure. Flowchart of Recruitment of Baseline Participants

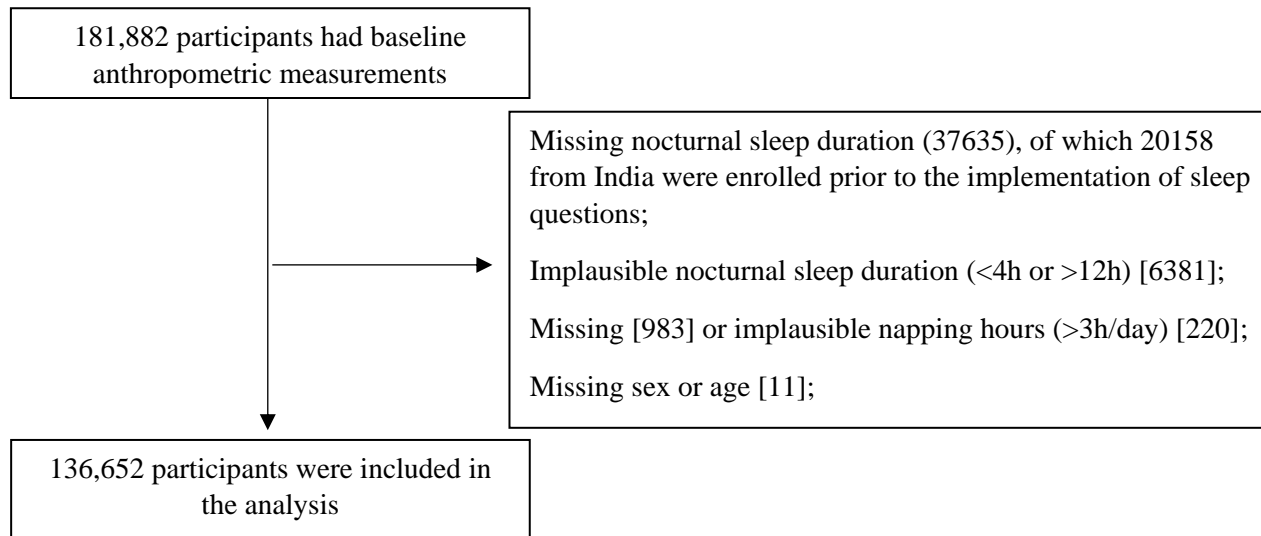
eTable 1. Sensitivity Analysis for Sleep Timing, Duration of Nocturnal Sleep and Napping by Using Ethnicity-Specific Criteria to Measure Obesity Outcomes

eTable 2. Multilevel Logistic Regression Analyses for Sleep Timing, Duration and Naps After Multiple Imputation

eAppendix. Prospective Urban Rural Epidemiology (PURE) Study Group

This supplemental material has been provided by the authors to give readers additional information about their work.

eFigure. Flowchart of Recruitment of Baseline Participants



eTable 1. Sensitivity Analysis for Sleep Timing, Duration of Nocturnal Sleep and Napping by Using Ethnicity-Specific Criteria to Measure Obesity Outcomes^a

Sleep patterns	General obesity ^b			Abdominal obesity ^b		
	No (%)	AOR (95% CI)	P value	No (%)	AOR (95%)	P value
Bedtime						
Daytime ^c	328 (18.5)	1.00 (0.86, 1.17)	0.98	771 (43.6)	0.93 (0.82, 1.05)	0.25
8PM – 10PM	5687 (18.1)	1.0		13631 (43.3)	1.0	
10PM – 00AM	18622 (22.2)	1.08 (1.03, 1.14)	<0.001	42701 (51.0)	1.08 (1.04, 1.12)	<0.001
00AM-2AM	5951 (33.2)	1.20 (1.13, 1.29)	<0.001	11379 (63.4)	1.21 (1.14, 1.28)	<0.001
2AM – 6AM	643 (37.4)	1.37 (1.20, 1.56)	<0.001	1127 (65.5)	1.21 (1.06, 1.39)	0.005
Wake-up time						
Before 4AM	542 (21.3)	0.92 (0.81, 1.06)	0.26	1338 (52.5)	0.81 (0.72, 0.90)	<0.001
4AM-6AM	8120 (20.7)	1.0		19468 (49.6)	1.0	
After 6AM	22569 (23.8)	1.05 (1.01, 1.09)	0.03	48803 (51.5)	1.06 (1.03, 1.10)	<0.001
Nocturnal sleep duration						
<5 hours	746 (28.9)	1.25 (1.11, 1.41)	<0.001	1554 (60.3)	1.08 (0.97, 1.21)	0.16
5-6 hours	1851 (28.8)	1.14 (1.05, 1.23)	0.001	3884 (60.4)	1.09 (1.02, 1.18)	0.01
6-7 hours	4369 (25.9)	1.04 (0.99, 1.10)	0.11	9560 (56.8)	1.04 (0.99, 1.09)	0.12
7-8 hours	8136 (23.1)	1.0		18521 (52.5)	1.0	
8-9 hours	8781 (20.8)	0.95 (0.91, 0.99)	0.02	20341 (48.3)	0.96 (0.93, 1.00)	0.04
9-10 hours	4843 (21.1)	0.95 (0.90, 1.00)	0.04	10577 (46.1)	0.92 (0.88, 0.96)	<0.001
≥10 hours	2505 (23.9)	0.96 (0.90, 1.03)	0.30	5172 (49.4)	0.95 (0.90, 1.02)	0.14

Nap duration (hour)						
0h	18520 (22.5)	1.0		41200 (50.0)	1.0	
0-1h	9736 (22.9)	1.14 (1.10, 1.18)	<0.001	22088 (51.9)	1.18 (1.15, 1.22)	<0.001
>1h	2975 (25.6)	1.20 (1.13, 1.27)	<0.001	6321 (54.4)	1.26 (1.20, 1.32)	<0.001

As for bedtime and wake-up time, adjusted for age, sex, education, location, country income status, smoking, drinking, family history of disease, diabetes, probable depression, physical activity, total energy intake, nocturnal sleep duration, naps and center as random effects;

As for nocturnal sleep duration, adjusted for age, sex, education, location, country income status, smoking, drinking, family history of disease, diabetes, probable depression, physical activity, total energy intake, bedtime, napping and center as random effects;

As for napping, adjusted for age, sex, education, location, country income status, smoking, drinking, family history of disease, diabetes, probable depression, physical activity, total energy intake, bedtime, nocturnal sleep duration and center as random effects.

^a Analysis population are those with baseline physical measurements (136,652)

^b Keeping using WHO's criteria for other ethnicities but adopting Chinese obesity criteria to measure general obesity for Chinese population ($\geq 28\text{kg/m}^2$); using IDF's ethnicity-criteria to measure abdominal obesity (WC>90cm or >94cm for male; WC>80cm for female).

^c Referring to bedtime between 6AM and 8PM.

eTable 2. Multilevel Logistic Regression Analyses for Sleep Timing, Duration and Naps After Multiple Imputation

Sleep schedule/duration	General obesity ^b		Abdominal obesity ^b	
	AOR (95% CI)	P value	AOR (95% CI)	P value
Bedtime				
Daytime ^a	1.17 (1.10 - 1.26)	<0.001	1.15 (1.08 - 1.22)	<0.001
8PM – 10PM	1.0		1.0	
10PM – 00AM	1.07 (1.03 - 1.12)	0.002	1.07 (1.03 - 1.12)	<0.001
00AM-2AM	1.21 (1.14 - 1.29)	<0.001	1.21 (1.14 - 1.28)	<0.001
2AM – 6AM	1.29 (1.16 - 1.44)	<0.001	1.41 (1.26 - 1.59)	<0.001
Wake-up time				
Before 4AM	0.89 (0.82 – 0.97)	0.008	0.88 (0.81 – 0.96)	0.003
4AM-6AM	1.0		1.0	
After 6AM	1.03 (0.99 - 1.07)	0.17	1.03 (0.98 - 1.07)	0.19
Nocturnal sleep duration				
<5 hours	1.19 (1.10 - 1.29)	<0.001	1.14 (1.06 - 1.22)	<0.001
5-6 hours	1.11 (1.04 - 1.18)	0.00	1.06 (0.99 - 1.13)	0.09
6-7 hours	1.04 (0.99 - 1.09)	0.08	1.04 (1.00 - 1.09)	0.06
7-8 hours	1.0		1.0	
8-9 hours	0.95 (0.91 - 0.99)	0.01	0.98 (0.94 - 1.02)	0.32
9-10 hours	0.96 (0.92 - 1.01)	0.12	0.99 (0.95 - 1.04)	0.67
>10 hours	0.98 (0.92 - 1.04)	0.52	1.00 (0.94 - 1.05)	0.87
Nap duration (hour)				
0	1.0		1.0	
0-1	1.12 (1.09 - 1.16)	<0.001	1.15 (1.12 - 1.19)	<0.001
≥1	1.15 (1.09 - 1.21)	<0.001	1.29 (1.23 - 1.35)	<0.001

Analysis population are those with baseline physical measurements after multiple imputation of missing data of sleep (161,724).

Sleep timing: Adjusted for age, sex, education, location, country income status, smoking, drinking, family history of disease, diabetes, depression, physical activity, total energy intake, nocturnal sleep duration, naps, and center as random effect.

Nocturnal sleep duration: Adjusted for age, sex, education, location, country income status, smoking, drinking, family history of disease, diabetes, depression, physical activity, total energy intake, bedtime, naps, and center as random effect.

Nap duration: Adjusted for age, sex, education, location, country income status, smoking, drinking, family history of disease, diabetes, depression, physical activity, total energy intake, nocturnal sleep duration, bedtime, and center as random effect.

^a Referring to bedtime between 6AM and 8PM.

^b Keeping using WHO's criteria for other ethnicities but adopting Chinese obesity criteria to measure general obesity for Chinese population ($\geq 28\text{kg/m}^2$); using IDF's ethnicity-criteria to measure abdominal obesity ($\text{WC} > 90\text{cm}$ or $> 94\text{cm}$ for male; $\text{WC} > 80\text{cm}$ for female).

eAppendix. Prospective Urban Rural Epidemiology (PURE) Study Group

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