



Resilience Effect and Association Analysis between Sleep Duration and Body Mass Index

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Dear Editor-in-Chief

During sleep, the human body physically heals itself to remove metabolic waste accumulated while active, and promotes the synthesis of molecules that restore and protect the brain from harmful factors produced while awake (1). Therefore, inadequate sleep patterns, including sleep quality and duration, are related to many health problems. In previous studies, sleep states have been associated with eating habits, diet quality, energy balance, obesity, metabolic syndrome, cardiovascular disease, type 2 diabetes (including insulin resistance), and even death (2-7).

Among the 18 countries surveyed by the Organization for Economic Co-operation and Development in 2015, the average sleeping duration was the lowest in Korea. Koreans tend to reduce sleep duration to do important tasks, such as be present in official work activities and meetings, and this behavior is not good for general health and health-related conditions (8). Although it is known that both sleep duration and obesity can affect health, the relationship between the two has been scarcely investigated in Korea. Therefore, we examined the relation between sleep duration and body mass index (BMI) in both Korean adults and older adults.

In this large-sample cross-sectional epidemiological study, we analyzed secondary data of 2,832

Korean adults (aged 20–64 yr) and 629 Korean older adults (aged >65 yr) from the 2015 Survey of National Physical Fitness. The aim was to deliver data representative of the Korean population regarding this association. The study was conceived and designed by the Ministry of Culture, Sports, and Tourism of Korea (9), and all study procedures were approved by the Korea Institute of Sport Science.

Sleep duration was determined by participants' self-reported responses to the question, "In the last month, how many hours a day did you sleep on average?". Participants' BMI was calculated by dividing their weight (kg) by their height (m²) (10).

All results are presented as mean±standard deviation. Partial correlation analyses, while adjusting for age, were performed to determine whether sleep duration was associated with BMI. Statistical significance was set at a $P<0.05$ and all analyses were performed using SPSS (version 25.0; IBM Corp., Armonk, NY, USA).

Participants' characteristics are listed in Table 1. Results for the partial correlation analysis adjusted for age for the relation between sleep duration and BMI are shown in Table 2. There was no significant correlation between sleep duration and BMI in female adults and both male and female



older adults. However, there was a significant correlation between sleep duration and BMI in

male adults ($P=0.028$).

Table 1: The characteristics of participants

Variables	Adults			Older adults		
	Male (n=1,683)	Female (n=1,149)	Total (N=2,832)	Male (n=264)	Female (n=365)	Total (N=629)
Age (yr)	38.17±12.71	39.43±13.10	38.68±12.88	72.20±5.25	73.60±5.87	73.01±5.66
Height (cm)	173.11±6.11	160.03±5.70	167.80±8.75	165.79±5.52	153.85±5.49	158.86±8.06
Weight (kg)	73.15±9.71	56.99±7.70	66.59±11.96	66.38±7.98	56.67±7.20	60.74±8.93
Body mass index (kg/m ²)	24.39±2.85	22.27±2.95	23.53±3.08	24.12±2.43	23.94±2.84	24.02±2.68
Sleep duration (hours/day)	6.60±1.05	6.71±1.08	6.64±1.06	6.46±1.23	6.26±1.23	6.34±1.23

Note: Data are expressed as mean±standard deviation

Table 2: Relationship between sleep duration and body mass index in Korean adults and older adults

Variables	Sleep duration (hours/day)											
	Male (n=1,683)		Adult Female (n=1,149)		Total (N=2,832)		Male (n=264)		Older adults Female (n=365)		Total (N=629)	
	r	P	r	P	r	P	r	P	r	P	r	P
Body mass index (kg/m ²)	-0.053	0.028*	0.017	0.565	-0.042	0.025*	-0.053	0.390	-0.009	0.861	-0.024	0.555

Note: * $P<0.05$, tested by partial correlation analysis after adjusting for age

The limitation of this study lies in its exclusive examination of the association between sleep duration and BMI, thus overlooking other important variables that may influence sleep and BMI, such as sleep quality, sleepiness, dietary patterns, regular exercise (including physical activity), sedentary behaviors, alcohol consumption, cigarette smoking, and drug abuse. More in-depth assessments on this association could be conducted in the future considering these various influencing factors.

In conclusion, there was no relationship between sleep duration and BMI in Korean female adults and both male and female older adults. Overall, sleep duration could not be considered as a predictive factor for BMI in Korea.

Conflict of interest

The authors declare that there is no conflict of interest.

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