



## **The Relationship between Sleep Duration and Blood Pressure in Korean Adults and Elderly**

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### **Dear Editor-in-Chief**

Adults' sleep duration has consistently decreased with the progression of economic development. In South Korea, an estimated 20% of adults exhibit a sleep duration of under 6 hours (1). A lack of sleep can increase blood pressure by stimulating sympathetic nerve function (2), and a chronic lack of sleep can lead to hypertension by keeping blood pressure high throughout the day, increasing heart rate, and increasing body salt retention (3). High blood pressure has become a national public health concern in South Korea because of its status as a precursor to cerebrovascular and cardiovascular disease, which, along with cancer, are the three most common causes of death in South Korea (4). Nevertheless, very few studies conducted on the relationship between sleep duration and blood pressure in South Korea. Thus, we examined the relationship between sleep duration and blood pressure in both Korean adults and elderly.

We analyzed the data of 2,832 Korean adults (aged 20 to 64 yr) and 629 elderly Korean individuals (aged over 65 yr) from the 2015 Survey of National Physical Fitness, a nationally representative physical fitness test conducted by the Korea Ministry of Culture, Sports and Tourism (5). The sampling frame covers all of South Korea. All study procedures were controlled and approved by the Korea Institute of Sport Science.

Systolic blood pressure (SBP) and diastolic blood pressure (DBP) in the right brachial artery were

measured by a nurse practitioner using a mercury sphygmomanometer (ALPK, Tokyo, Japan), after participants had rested for more than 10 min in a sitting position. Sleep duration was measured using a single question: "In the last one month, what time did you go to bed and wake up?" They responded by providing the average sleep duration over the last one month.

All results are presented as mean  $\pm$  standard deviation. Partial correlation analyses, adjusted for age and body mass index (BMI), were carried out to determine whether sleep duration was related to blood pressure. The significance level was set at  $P < 0.05$ , and all analyses were performed using PASW Statistics 18.0 (SPSS Inc., Chicago, IL, USA).

The participants' characteristics are shown in Table 1. The partial correlation analysis results are shown in Table 2. Among both adults and the elderly, regardless of gender, sleep duration was not significantly correlated with SBP ( $P > 0.05$ ) or DBP ( $P > 0.05$ ).

We should note a limitation of this study: we investigated only sleep duration. Sleep quality and sleepiness are also believed to be important factors influencing blood pressure, but they were not evaluated in the 2015 Survey of National Physical Fitness. For this reason, in the future, further well-designed studies are necessary.

**Table 1:** The participants' characteristics

Variables	Adults		Elderly	
	Men (n = 1,683)	Women (n = 1,149)	Men (n = 264)	Women (n = 365)
Age (yr)	38.2 ± 12.7	39.4 ± 13.1	72.2 ± 5.3	73.6 ± 5.9
Height (cm)	173.1 ± 6.1	160.0 ± 5.7	165.8 ± 5.5	153.9 ± 5.5
Weight (kg)	73.2 ± 9.7	57.0 ± 7.7	66.4 ± 8.0	56.7 ± 7.2
SBP (mmHg)	125.5 ± 11.4	121.7 ± 11.8	126.0 ± 12.0	123.7 ± 11.1
DBP (mmHg)	77.4 ± 8.4	74.7 ± 9.1	75.0 ± 9.4	75.4 ± 9.2
Sleep duration (hours/day)	6.6 ± 1.1	6.7 ± 1.1	6.5 ± 1.2	6.3 ± 1.2

SBP: systolic blood pressure; DBP: diastolic blood pressure  
Values are expressed as mean ± standard deviation or n (%)

**Table 2:** The relationship between sleep duration and blood pressure in Korean adults and elderly

Variables	Sleep duration (hours/day)							
	Adult				Elderly			
	Men (n = 1,683)		Women (n = 1,149)		Men (n = 264)		Women (n = 365)	
	r	P	r	P	r	P	r	P
SBP (mmHg)	0.005	0.851	0.012	0.675	-0.005	0.940	0.065	0.220
DBP (mmHg)	-0.032	0.187	0.006	0.850	-0.108	0.080	0.069	0.192

SBP: systolic blood pressure; DBP: diastolic blood pressure  
Tested by partial correlation analysis after adjusting for age and body mass index

In conclusion, no relationship between sleep duration and blood pressure was found in either Korean adults or elderly. Accordingly, sleep duration might not be considered a predictive factor for hypertension in South Korea.

## Conflict of interest

The authors declare that there is no conflict of interest.

## References

- Dorans KS, Mills KT, Liu Y, et al (2018). Trends in Prevalence and Control of Hypertension According to the 2017 American College of Cardiology/American Heart Association (ACC/AHA) Guideline. *J Am Heart Assoc*, 7(11):e008888.
- Sharman JE, La Gerche A, Coombes JS (2015). Exercise and cardiovascular risk in patients with hypertension. *Am J Hypertens*, 28(2):147-158.
- Cheung CL, Nguyen US, Au E, et al (2013). Association of handgrip strength with chronic diseases and multi-morbidity: a cross-sectional study. *Age (Dordr)*, 35(3):929-941.
- Korea National Statistics Office (2018). Death statistics in 2017 (in Korean). Daejeon: Korea National Statistical Office. Available from [In Korean]: <http://kostat.go.kr>
- Korea Ministry of Culture, Sports and Tourism (2016). 2015 Survey of National Physical Fitness (in Korean). Korea Ministry of Culture, Sports and Tourism. Available from [In Korean]: <https://www.sports.re.kr>