



Impact of Sleep Duration on Metabolic Syndrome Risk in Emerging Adults

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Introduction

Research suggests sleep duration can influence metabolic systems including fasting glucose, blood pressure, hormone regulation, nervous system activity, and total energy expenditure (TEE), all of which are related to cardiometabolic disease risk^{2,3,5}.

Metabolic Syndrome

Metabolic Syndrome (MetS) is defined as the co-occurrence of three or more of the following cardiovascular risk factors;

- Fasting Glucose: ≥ 100 mg/dL
- Waist Circumference: >102 cm (Male) or >88 cm (Female)
- Blood Pressure: $\geq 130/85$ mmHg
- Triglycerides: ≥ 150 mg/dL
- HDL-C: <40 mg/dL (Male) or <50 mg/dL (Female)

Metabolic Syndrome Severity Scores (MSSS) calculate an individual's risk and severity of metabolic syndrome based on their sex and race; they are scored on a range from negative to positive infinity^{1,4}.

Purpose

The purpose of this study is to compare the metabolic syndrome severity scores (MSSS) between varying sleep durations in a sample of emerging adults (18-24y/o).

Methods

- Data were collected from 2012-2021 from the College Health and Nutrition Assessment Survey.(UNH IRB #5524)
- Anthropometric, biochemical, and clinical measures were obtained following an overnight fast and used to assess the prevalence if metabolic syndrome (MetS).
- Metabolic Syndrome severity scores (MSSS) were calculated using race- and sex-specific formulas⁴.
- Sleep duration was calculated from the difference in self-reported bedtime and get-up time acquired through an online survey.
- ANCOVA was used to examine the relationship between sleep duration and MetS severity score while adjusting for covariates (age, sex, BMI, physical activity level, smoking status, alcohol consumption, and major).

Results

Table 1: Participant Demographics

		Men		Women	
		Mean	Standard Deviation	Mean	Standard Deviation
Age (years)		19 \pm 1		19 \pm 1	
BMI (kg/m ²)		24.4 \pm 3.8		23.0 \pm 3.6	
		n	%	n	%
Health and/or Nutrition Major	Non-Health and/or Nutrition Major	1049	83.2%	1982	73.1%
	Health and/or Nutrition Major	212	16.8%	728	26.9%
Smoker Status	Non-Smoker	1149	91.1%	2619	96.6%
	Smoker	112	8.9%	91	3.4%
Class	Freshmen	597	47.3%	1575	58.1%
	Sophomore	437	34.7%	821	30.3%
	Junior	142	11.3%	203	7.5%
	Senior	73	5.8%	96	3.5%
	Other	12	1.0%	15	0.6%
Race	Hispanic	37	3.0%	87	3.3%
	Non-Hispanic White	1085	87.9%	2435	91.5%
	Non-Hispanic Black/African-American	21	1.7%	22	0.8%
	Non-Hispanic American Indian/Alaskan Native	5	0.4%	11	0.4%
	Non-Hispanic Asian	86	7.0%	106	4.0%

kg, kilograms; m, meters

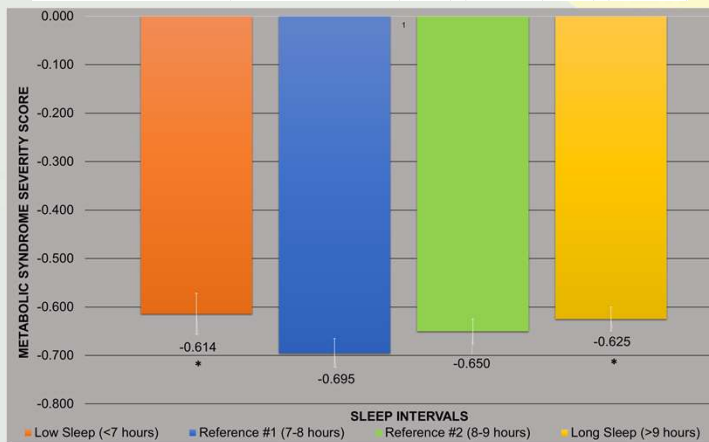


Figure 1: Metabolic Syndrome Severity scores in Emerging adults, categorized by sleep duration, * p<0.01 compared to Reference #1

Results (Cont.)

- Of the final sample (n=3,893), Mean MSS was -0.65 ± 0.56 and reported sleep duration was 7.91 ± 1.2 hours/day.

Prevalence of Metabolic Syndrome Criteria

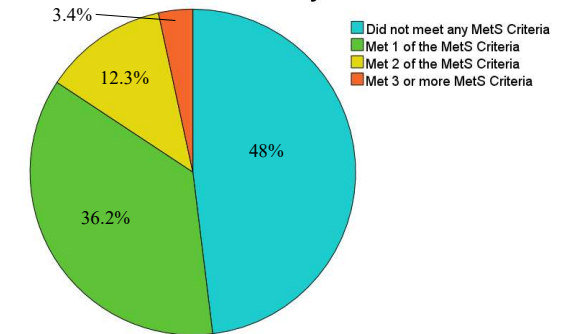


Figure 2: 3.4% of the population exhibited ≥ 3 Metabolic Syndrome criteria.

Conclusion

Our findings suggest that short (≤ 7 h/d) and long (≥ 9 h/d) sleep durations raise the risk of Metabolic Syndrome in a sample of emerging adults. Further research is needed to elucidate the impact of improving sleep habits on future disease risk.

Acknowledgments

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