

The Relationship between Sleep Duration and Cardiometabolic Risk Factors Depends on Race/Ethnicity and Whether Risk Factors Were Self-Reported or Objectively-Determined

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INTRODUCTION: Sleep duration is associated with cardiometabolic disease risk factors including hypertension, hyperlipidemia, diabetes and obesity. Not only are short and long sleep duration disproportionately experienced among race/ethnicity groups, but these cardiometabolic risks are as well. It is possible that the relationship between cardiometabolic disease and sleep depends on race/ethnicity. Also, this may depend on whether cardiometabolic risk is self-reported vs objectively-determined.

METHODS: We analyzed adult 2007-2008 National Health and Nutrition Examination Survey (NHANES) data (N=5,649). Average self-reported nightly sleep duration was reported and categorized as either ≤ 4 h, 5-6h, 7-8h, or ≥ 9 h. Self-reported as well as objectively-determined obesity, diabetes, hypertension, and hyperlipidemia were recorded. Binary logistic regression analyses, stratified by race/ethnicity, were performed using cardiometabolic factor as the outcome variable, and sleep duration category as the predictor variable, after adjusting for age, sex, acculturation, education, access to insurance, food security, home ownership, smoking, and caffeine use.

RESULTS: Significant sleep*race/ethnicity interactions existed for all cardiometabolic outcomes using both measurement approaches (all $p < 0.005$). Among non-Hispanic Whites, ≤ 4 h was associated with self-reported hypertension (OR=1.91;95%CI[1.18,3.09]; $p=0.009$), hyperlipidemia (OR=2.10;95%CI[1.33,3.32]; $p=0.002$), and diabetes (OR=2.40;95%CI[1.27,4.52]; $p=0.007$), and objectively-determined hyperlipidemia (OR=1.62;95%CI[1.03,2.54]; $p=0.035$), and ≥ 9 h was associated with objectively-determined hyperlipidemia (OR=1.55;95%CI[1.07,2.25]; $p=0.020$). Among Blacks/African-Americans, ≤ 4 h was associated with self-reported hypertension (OR=2.12;95%CI[1.25,3.61]; $p=0.005$) and obesity (OR=1.91;95%CI[1.20,3.05]; $p=0.007$). Among Mexican-Americans, 5-6h was associated with self-reported hypertension (OR=1.93;95%CI[1.25,2.96]; $p=0.003$) and obesity (OR=1.45;95%CI[1.04,2.04]; $p=0.030$) and ≥ 9 h was associated with less self-reported hyperlipidemia (OR=0.41;95%CI[0.20,0.85]; $p=0.016$). Among other Hispanics/Latinos, ≤ 4 h was associated with self-reported (OR=3.53;95%CI[1.50,8.29]; $p=0.004$) and objectively-determined (OR=2.86;95%CI[1.21,6.73]; $p=0.016$) hypertension and 5-6h was associated with less objectively-determined diabetes (OR=0.45;95%CI[0.23,0.89]; $p=0.022$). Among Asians/Others, ≤ 4 h was associated with self-reported (OR=11.50;95%CI[2.30,59.10]; $p=0.003$) and objectively-determined (OR=3.74;95%CI[1.16,12.03]; $p=0.027$) hyperlipidemia.

CONCLUSIONS: The relationship between sleep duration and cardiometabolic risk factors depended on race ethnicity for each risk factor assessed, though the patterns differed. Also, whether hypertension, hyperlipidemia, diabetes and obesity were assessed via self-report or by objective measures dictated results in some cases. Future studies should carefully consider these factors in determining individual and population-level risk.

SUPPORT: This work was supported by the National Heart, Lung and Blood Institute (K23HL110216), the National Institute of Environmental Health Sciences (R21ES022931), and the University of Pennsylvania CTSA (UL1RR024134).