



Racial Sleep Duration Disparities: Exploring urban environmental and health differences in sleep durations for Blacks and Whites

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BACKGROUND

- > Sleep durations of 6 hours or less per night are associated with multiple adverse health outcomes (i.e. coronary artery disease, stroke, hypertension, diabetes, obesity, inflammation, depression, and anxiety; King et al., 2008; Gottlieb et al., 2006; Van Cauter et al., 2008; Patel & Hu, 2008; Prinz, 2004; Perlman et al., 2006; Taylor et al., 2005)
- > Blacks tend to report shorter and longer sleep durations than whites (Hale & Do, 2007; National Sleep Foundation, 2010; Durrence & Lichstein, 2006)
- > Blacks are more likely to reside in urban and highly populated environments, which may explain previous reports of racial sleep duration disparities (Hale & Do, 2007)
- > Individuals residing in urban and/or heavily populated environments may be at an increased risk for short sleep durations due in part to stressful neighborhood conditions (i.e., crime, noise, and discrimination; Hale & Do, 2007)
- > Limited research has explored differences in sleep duration between blacks and whites residing in similar urban environments

SPECIFIC AIMS

- > Examine differences in racial sleep durations between blacks and whites
- > Examine whether sleep duration differences in socio-demographic and health indices are consistent between blacks and whites

PARTICIPANTS

- > 1207 Healthy Aging in Neighborhoods of Disparities across the Life Span (HANDLS) participants
- > Mean sample baseline age of 47 (SD = 8.74, range 30-64)
- > Mean sample education of 12.77 (SD = 3.18, range 1-21)
- > 715 Females; 492 Males
- > 608 Whites; 599 Blacks

MEASURES & PROCEDURES

Sleep Duration - self-report of how many hours on average a participant slept in past month; responses ranged from 0 (>7 hours) to 2 (<6 hours)

Socio-Demographics

- > Age, Sex, Race, and Education
- > Poverty Status – categorized as 0 (family income <125%) or 1 (family income >125%) as defined by the Federal poverty threshold
- > Perceived Neighborhood Disorder (Simcha-Fagan and Schwartz, 1986) – self-report of neighborhood characteristics (i.e., graffiti, litter, abandoned cars, and crime); item response range from 1 (very rare) to 5 (very common)
- > Trust of People in Neighborhood – self-report of feeling of people in neighborhood can be trusted; item response range from 1 (strongly agree) to 5 (strongly disagree)
- > Discrimination (Williams et al., 1997) – self-report of the frequency of day-to-day experiences (i.e., being treated with less courtesy, respect, and being harassed); item response range from 1 (almost everyday) to 6 (never)

Mental Health Status

- > Vigilance (Taylor & Seeman, 1999) – 6-item subscale of the Multiscale Measure of Reactive Responding; total score ranges from 1 (low vigilance) to 30 (high vigilance)
- > Depression (Radloff, 1977) – Center for Epidemiological Studies-Depression (CES-D), total score ranges from 1 (no depressive symptoms) to 60 (high depressive symptoms)
- > Perceived Stress (Cohen et al., 1983) – 4-item scale regarding feelings and thoughts within the past month; total score ranges from 1 (no stress) to 20 (very stressed)

Physical Health Status

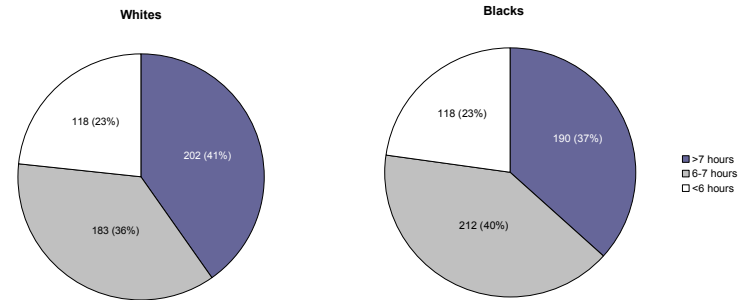
- > Coronary Artery Disease (CAD), Diabetes (self-report history of diabetes, fasting glucose >125, and/or use of hypoglycemic agents), Body Mass Index (BMI), Blood Pressure, and Inflammation (i.e., hsCRP)

Procedure

- > Analysis of Variance (ANOVA) were used to explore racial differences in sleep duration
- > ANOVA and chi-square tests were used to explore sleep duration differences in socio-demographic and health status separately for whites and blacks

RESULTS

Specific Aim 1: No significant differences in sleep duration observed between whites and blacks



Specific Aim 2: In Whites, inadequate sleep is associated with poverty, lower levels of education, perceived neighborhood disorder, less trust of people in neighborhood, reduced vigilance, depressive symptoms, coronary artery disease, and greater body mass index

	Sleep Duration			Pairwise Comparison
	>7 hours ¹	6-7 hours ²	<6 hours ³	
Age	47.34 ± 0.62	47.71 ± 0.65	47.99 ± 0.81	-
Female	112 (55.4)	114 (62.3)	70 (59.3)	-
Poverty Status, Below	51 (25.2)	54 (29.5)	54 (45.8)	-
Education	13.62 ± 0.24	12.72 ± 0.26	11.30 ± 0.33	1>2*, 1>3***, 2>3**
Neighborhood Disorder	31.28 ± 0.90	34.35 ± 0.97	37.18 ± 1.23	3>1***
Graffiti, Common	66 (33.8)	57 (33.5)	48 (45.3)	-
Litter, Common	115 (59.0)	108 (63.5)	79 (74.5)	-
Abandoned Cars, Common	21 (10.8)	104 (27.3)	78 (34.8)	-
Drug Dealers, Common	33 (47.7)	100 (58.8)	73 (68.8)	-
Loitering Adults, Common	67 (34.4)	78 (45.9)	56 (52.9)	-
Gang Activity, Common	32 (16.7)	34 (20.4)	31 (29.5)	-
Misbehaving Children, Common	60 (30.8)	76 (44.7)	57 (53.7)	-
Prostitution, Common	64 (33.0)	75 (44.1)	51 (48.1)	-
Abandoned Buildings, Common	45 (23.0)	56 (33.0)	35 (33.0)	-
Broken Windows, Common	29 (14.9)	29 (17.1)	34 (32.1)	-
Crime, Common	35 (17.9)	44 (25.9)	42 (39.6)	-
Unkempt Houses, Common	56 (28.7)	55 (32.4)	53 (52.0)	-
Trust People, Disagree	45 (23.0)	56 (32.9)	48 (45.3)	-
Discrimination	43.66 ± 0.56	41.82 ± 0.60	43.54 ± 0.76	-
Vigilance	14.30 ± 0.51	14.24 ± 0.52	11.46 ± 0.68	3<1, 2**
CESD	12.94 ± 0.81	14.77 ± 0.85	18.93 ± 1.08	3>1***, 3>2***
Stress	10.64 ± 0.37	9.92 ± 0.38	10.55 ± 0.49	-
CAD, Yes	4 (2.2)	5 (3.1)	9 (8.5)	-
Diabetes, Yes	30 (15.4)	32 (18.1)	22 (20.2)	-
BMI	29.52 ± 0.53	30.85 ± 0.56	31.86 ± 0.71	3>1*
hsCRP	3.71 ± 0.51	4.89 ± 0.53	5.48 ± 0.68	-
BP Diastolic	72.27 ± 0.76	72.43 ± 0.79	73.82 ± 1.00	-
BP Systolic	118.40 ± 1.27	118.14 ± 1.33	120.44 ± 1.68	-

Specific Aim 2: In Blacks, inadequate sleep is associated depressive symptoms and inflammation

	Sleep Duration			Pairwise Comparison
	>7 hours ¹	6-7 hours ²	<6 hours ³	
Age	45.89 ± 0.63	46.93 ± 0.60	47.07 ± 0.80	-
Female	104 (54.7)	127 (59.9)	74 (62.7)	-
Poverty Status, Below	91 (47.9)	90 (42.5)	64 (54.2)	-
Education	12.62 ± 0.19	12.56 ± 0.18	12.15 ± 0.25	-
Neighborhood Disorder	29.30 ± 0.96	28.87 ± 0.91	31.21 ± 1.21	-
Graffiti, Common	41 (21.6)	47 (22.3)	30 (25.5)	-
Litter, Common	94 (49.7)	100 (47.4)	68 (57.6)	-
Abandoned Cars, Common	23 (12.1)	37 (17.6)	31 (26.3)	-
Drug Dealers, Common	91 (48.2)	90 (42.6)	61 (51.7)	-
Loitering Adults, Common	75 (39.7)	76 (36.3)	47 (39.8)	-
Gang Activity, Common	28 (15.1)	38 (18.2)	27 (23.3)	-
Misbehaving Children, Common	60 (31.7)	65 (30.8)	47 (39.8)	-
Prostitution, Common	38 (20.3)	37 (17.7)	33 (28.2)	-
Abandoned Buildings, Common	60 (31.7)	61 (29.0)	43 (36.5)	-
Broken Windows, Common	31 (16.4)	37 (17.6)	30 (25.4)	-
Crime, Common	30 (15.9)	38 (18.3)	27 (22.9)	-
Unkempt Houses, Common	54 (28.6)	57 (27.0)	37 (31.3)	-
Trust People, Disagree	57 (30.3)	58 (27.7)	40 (33.9)	-
Discrimination	42.34 ± 0.62	41.56 ± 0.59	41.05 ± 0.78	-
Vigilance	11.51 ± 0.52	11.92 ± 0.51	11.19 ± 0.65	-
CESD	12.70 ± 0.80	13.41 ± 0.77	18.01 ± 1.03	3>1, 2***
Stress	8.76 ± 0.41	9.22 ± 0.40	10.17 ± 0.51	-
CAD, Yes	5 (3.0)	5 (3.0)	5 (4.9)	-
Diabetes, Yes	17 (9.8)	22 (11.5)	19 (17.4)	-
BMI	29.91 ± 0.61	29.91 ± 0.58	30.82 ± 0.77	-
hsCRP	5.16 ± 0.85	2.99 ± 0.82	6.87 ± 1.07	3>2*
BP Diastolic	71.83 ± 0.84	72.22 ± 0.80	74.65 ± 1.06	-
BP Systolic	120.10 ± 1.28	119.58 ± 1.21	123.29 ± 1.60	-

Note. **Bold** values represent significant group differences. ¹p = 0.05. ²p < 0.05. ³**p < 0.01. ⁴***p < 0.001. Means and (standard errors) illustrated for continuous variables. Number of (percentage) illustrated for dichotomous variables.

CONCLUSIONS

- > Almost a quarter of whites and blacks report less than 6 hours of sleep, considerably below the 7½-8½ sleep duration recommended by the American Academy of Sleep Medicine (AASM).
- > Racial disparities in sleep duration as previously observed appear to be minimized between blacks and whites residing in an urban environment, in that black and white HANDLS participants showed no significant differences in sleep durations.
- > However, potential racial differences in neighborhood perception, discrimination, stress, and/or limited resources may explain racial differences in the associations between inadequate sleep and health outcomes.
- > Elucidating the mechanisms that explain the social determinants of sleep quantity and quality has the potential to broaden our understanding of health disparities and suggest new avenues for intervention programs.