Sleep Disturbances in Midlife Women:

Are there Ethnic or Class Differences, or Is it All Just Hormonal?

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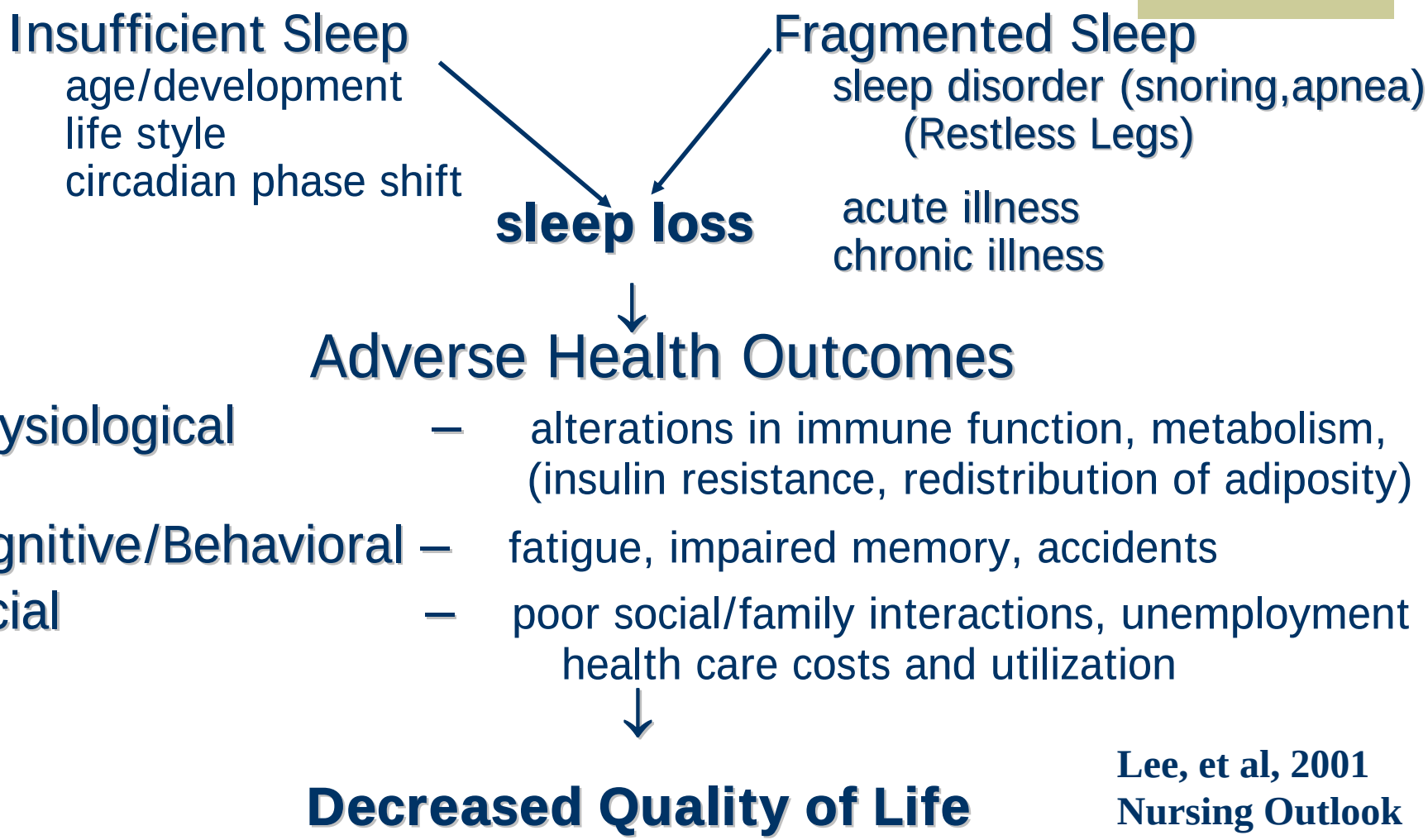
Framework for Sleep Disturbances

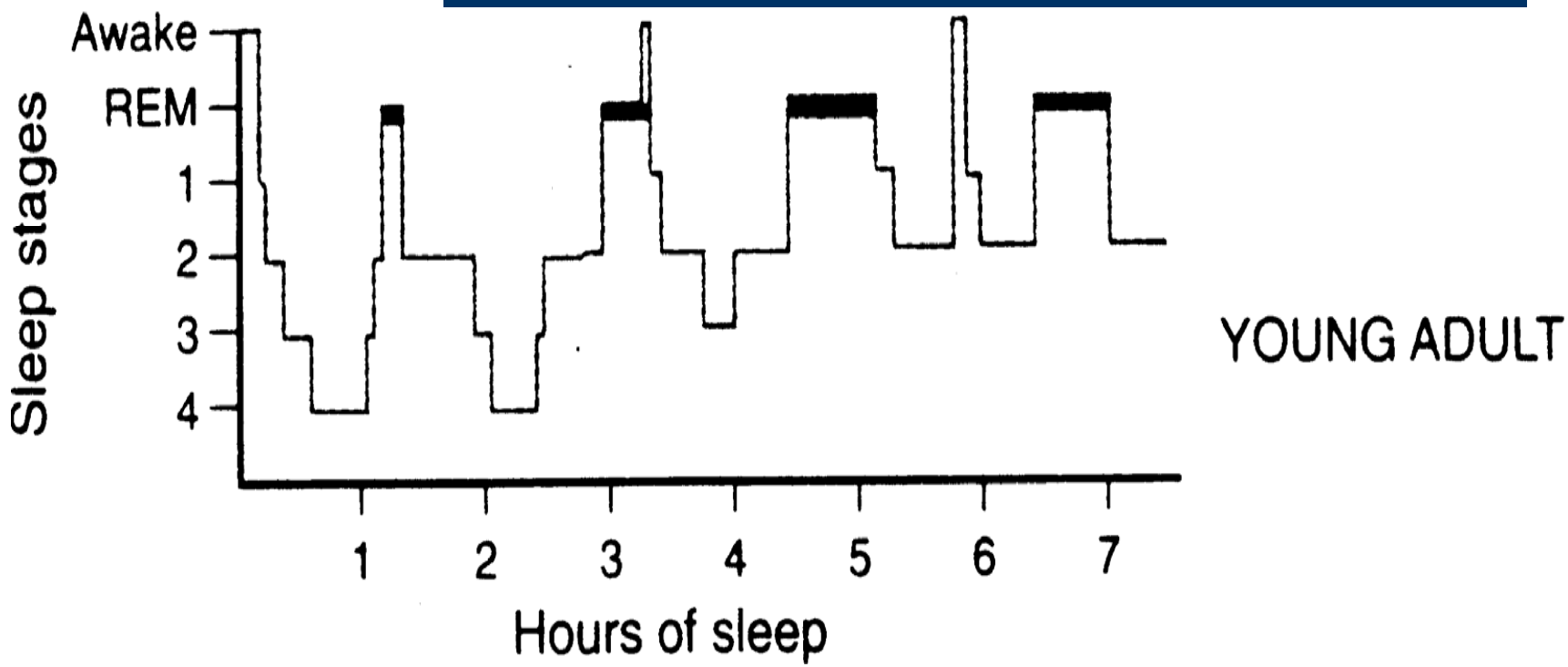


Lee, et al, 2001
Nursing Outlook

Sleep Measures

- **Polysomnography (PSG): The Gold Standard**

Typical Adult Sleep



Wrist Actigraphy

- Movement counts and acceleration of movement
- Estimates total sleep time and awakenings
- Underestimates sleep in active sleepers
- Overestimates sleep in sedentary persons
- Not useful for sleep stages
- Less invasive than PSG

Literature Review on Sleep and Health Disparities

Paine S, Gander PH, & Travier N (2006).

***J Biological Rhythms*, 21:68-76.** The epidemiology of morningness/eveningness: Influence of age, gender, ethnicity, and socioeconomic factors in adults (30-49 years).

- 5000 random New Zealanders (50% response)
  - Evening chronotype: 2.5x more likely to be in poorer health,
    1.5x more likely to be a night-shift worker,
    1.5x more likely to be unemployed.
  - Chronotype was independent of gender, ethnicity (Maori or non-Maori), and socioeconomics.
  - No difference in self-reported sleep duration

Literature Review *(continued)*

Moore P, Adler NE, Williams DR, Jackson JS (2002). ***Psychosomatic Medicine*, 64:337-344.** Socioeconomic status and health: the role of sleep.

- Community sample of 1,139 adults in Detroit and self-report of sleep quantity and quality.
- Sleep **quantity** (mean 6.5±1.4 hrs) was less for non-Whites compared to Whites, and was related to mental and physical health, but not to SES.
- Sleep **quality** mediated effects of income on mental and physical health.
- Income mediated the effect of education on sleep **quality**.

Literature Review *(continued)*

Villaneuva A, Buchanan P, Yee B, Grunstein R (2005). ***Sleep Med Rev*, 9:419-436**. Ethnicity and obstructive sleep apnoea.

Sleep apnea, obstructive sleep apnea (OSA), obstructive sleep apnea syndrome (OSAS), sleep disordered breathing (SDB):

- complex disorder determined by several phenotypes: obesity, craniofacial structure, abnormal neuromuscular and ventilatory control.
- Genetics may explain ethnic clustering, modulated by cultural and environmental factors (See Redline, Cleveland Cohort Study)

Literature Review *(continued)*

Friedman M, Bliznikas D, Duggal P, et al (2006).

***Otolaryngol Head Neck Surg*, 134: 545-50.** Comparison of the incidence of obstructive sleep apnea-hypopnea syndrome in African-Americans versus Caucasian-Americans.

- significantly higher incidence of "probable" OSAHS in African Americans (in Chicago sample) with health fair screening, and
- their bed partners were more likely to accept the snoring as normal.

Literature Review *(continued)*

Lauderdale D, Knutson K, Yan L, Rathouz P, Hulley S, Sidney S, & Liu K (2006).

***Am J Epidemiol*, 164:5-16**. Objectively measured sleep characteristics among early-middle-aged adults: The CARDIA study.

- Sleep duration with actigraphy was 6.1±1.2 hrs
  - 6.7 hrs for White women 6.1 hrs for White men
  - 5.9 hrs for Black women 5.1 hrs for Black men
- Significant after adjusting for SES, employment, household and lifestyle factors, and apnea risk.

Dawn Dailey's study

Secondary analysis using CDC's 2002 Behavioral Risk Factor Surveillance System (BRFSS) database -- ongoing data collection program to measure behavioral risk factors in random samples of adults 18 years and older

N = 62,341 individuals 18 to 65 years.

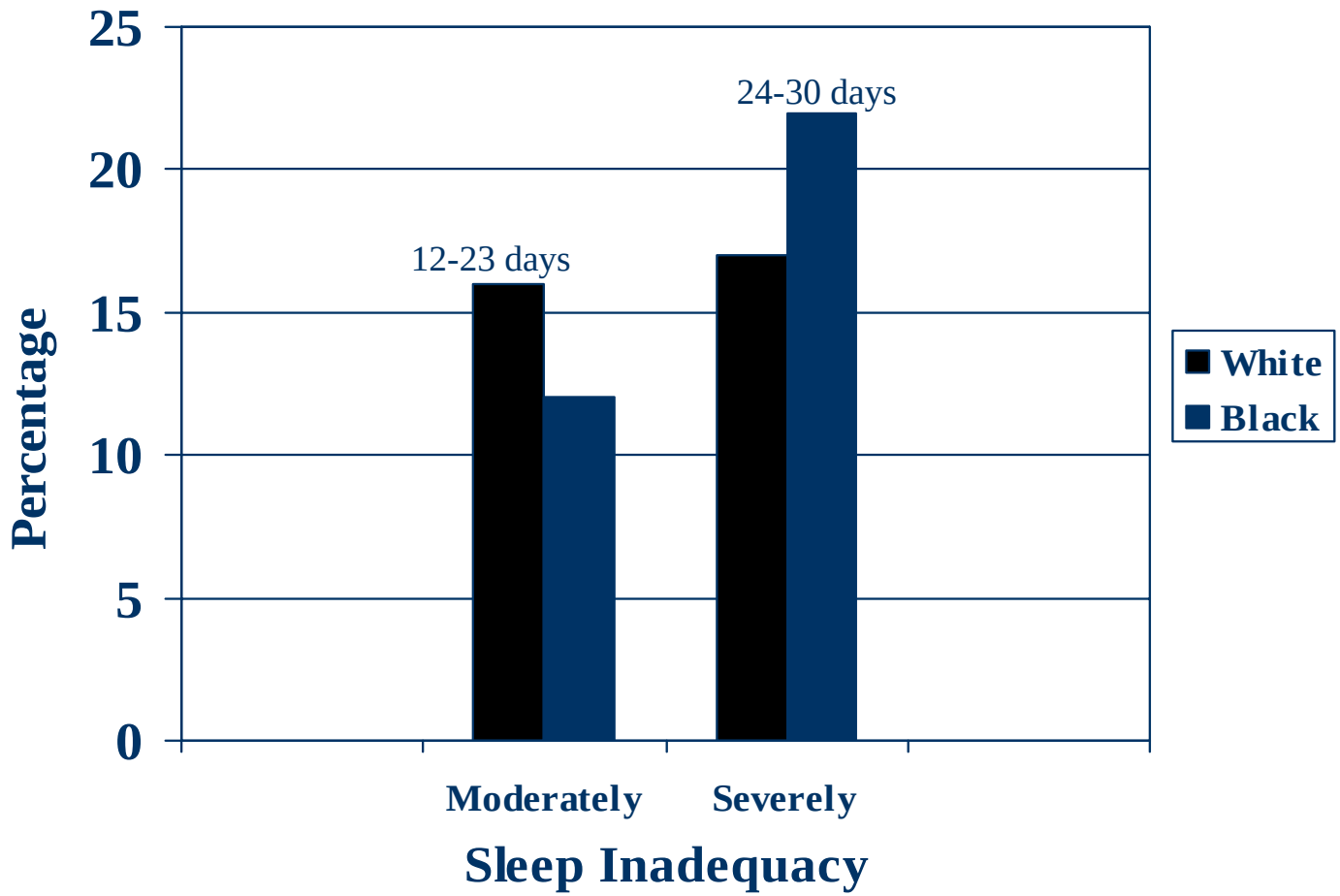
Sleep adequacy:

- **During the past 30 days, for about how many days have your felt you did not get enough rest or sleep?**

Recoded categories:

- **Adequate= 0- 11 days**
- **Moderately inadequate = 12-23 days**
- **Severely inadequate = 24-30 days**

Dawn Dailey's Results



Dawn Dailey's Results

1. very little variance ($R^2 < 4\%$) in sleep adequacy was due to external factors (role demands).

2. ethnicity was not a significant predictor of sleep inadequacy.

3. anxiety, depression, and perceived health were significant predictors of sleep inadequacy ($R^2 = 15\%$).

4. sleep inadequacy in Caucasian women explained by: anxiety, depression, age, perceived health, and number of children.

5. sleep inadequacy in African American women explained by: anxiety, depression, age, physical illness and employment.

National Sleep Foundation Poll (1998)

- Women report about 6.5 hrs sleep/night
- Women report 8-13 more minutes of sleep per night than men, but
- More women c/o insomnia (63%) than men (54%)
  - Trouble sleeping at least 1/wk (Better Sleep Council):
    - Women: 26%
    - Men: 16%

Prevalence of sleep problems in midlife women:

	Sleep "Problem"*	Sleep Med**
◆ 38 y/o	20%	2%
◆ 50y/o	37%	12%
◆ 60y/o	37%	

* Bjorkelund, et al, (2002) Sleep

**Asplund & Aberg (1995) Maturitas.

**Asplund & Aberg (1996). Maturitas.

WHY???

✷✷✷✷***THE FLASH*** ✷✷✷

most common symptom associated with estrogen insufficiency:

hot flash, flush, night sweat

Hot Flashes and Sleep

- **Wake episode occurs up to 1 minute before a change in skin resistance or temperature is detected.**

- **60% of awakenings are associated with a hot flash.**

Erlik, et al. (1981). JAMA, 245.
n=9 (30-55 y/o) post-menopause 1-5 yrs 3 nights polysomnography

Longitudinal Midlife Study

- To describe women's sleep over time, from pre-menopause to post-menopause, in relation to bio-psycho-social-cultural factors:
  - FSH level
  - diet, exercise, smoking, & body weight
  - stress and emotional health
  - family and social relationships

Co-Investigators

- Yewoubdar Beyene, PhD — Anthropologist
- Yolanda Gutierrez, PhD, RD — Nutritionist
- Nan Murrell, RN, PhD — UT Galveston
- Diana Taylor, RN, PhD, FAAN — UCSF
- John Neuhaus, PhD — Statistician — UCSF
- Catherine Gilliss, RN PhD FAAN — Yale

(NIH R01 NR04259, 1995-2000)
Office of Women's Health Supplement, 2001-2002

Methods

Community-based sample of healthy regularly menstruating women

Live in U.S. at least 20 years

40 - 48 years of age

- Self-Identified as:

  European American

  African American

  Mexican/Central America

Sleep Measures

- Pittsburgh Sleep Quality Index
  - 7 components (Buysse, et al., 1989)
- Paffenbarger Physical Activity Scale
  - Reclining/sleeping weekdays
  - Reclining/sleeping weekends
- Wrist actigraphy with sleep log

  (Ambulatory Monitoring, Inc, NY)

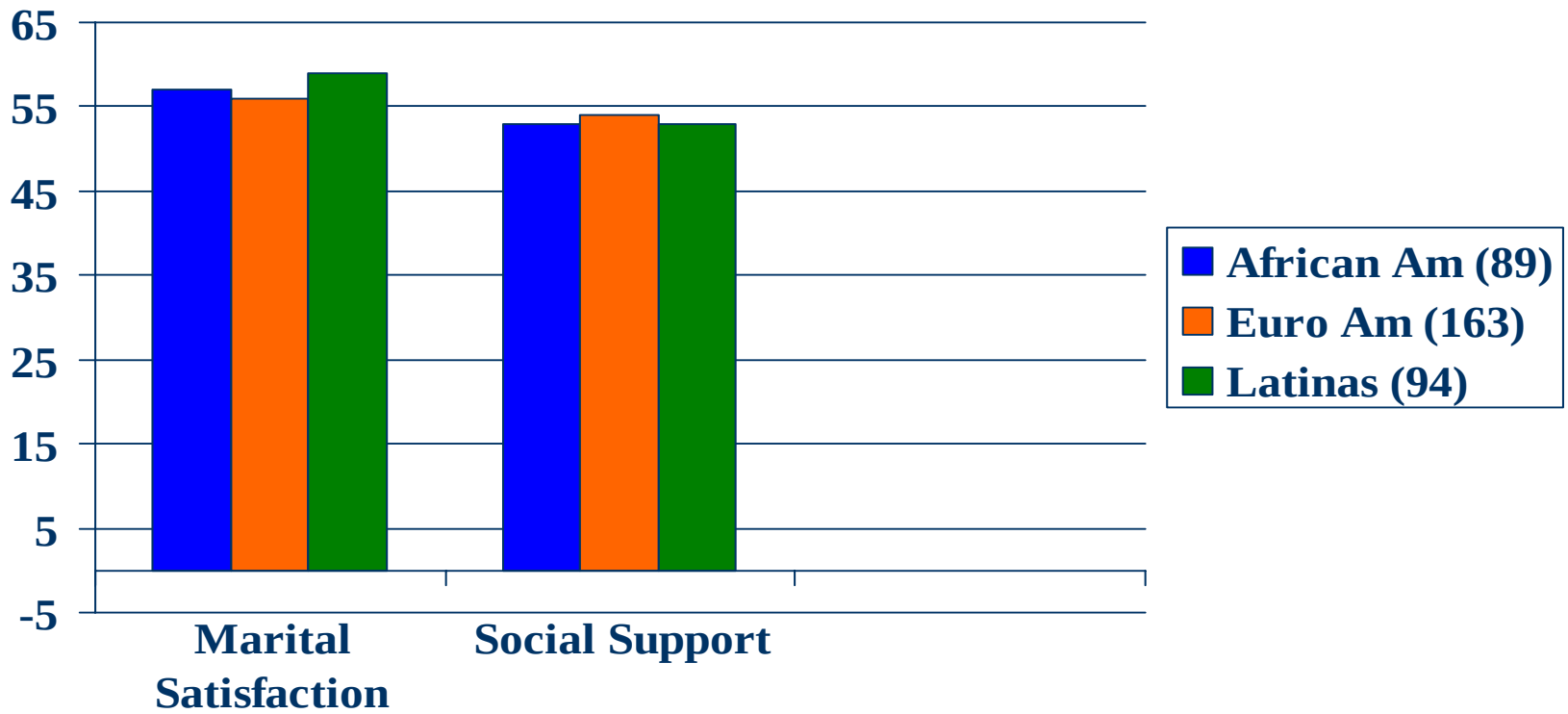
Demographic Characteristics

	African American (n = 89)	European American (n = 163)	Mexican/Central American (n = 94)
Age (Mean ± SD)	43.1 ± 2.5	43.4 ± 2.2	43.6 ± 2.5
FSH (urine IU/dl)	0.9 ± .66	0.7 ± .55	0.7 ± .47
Currently Smoke	32%	17%	21%
Mean household income/yr	$40,000*	$70,000	$50,000

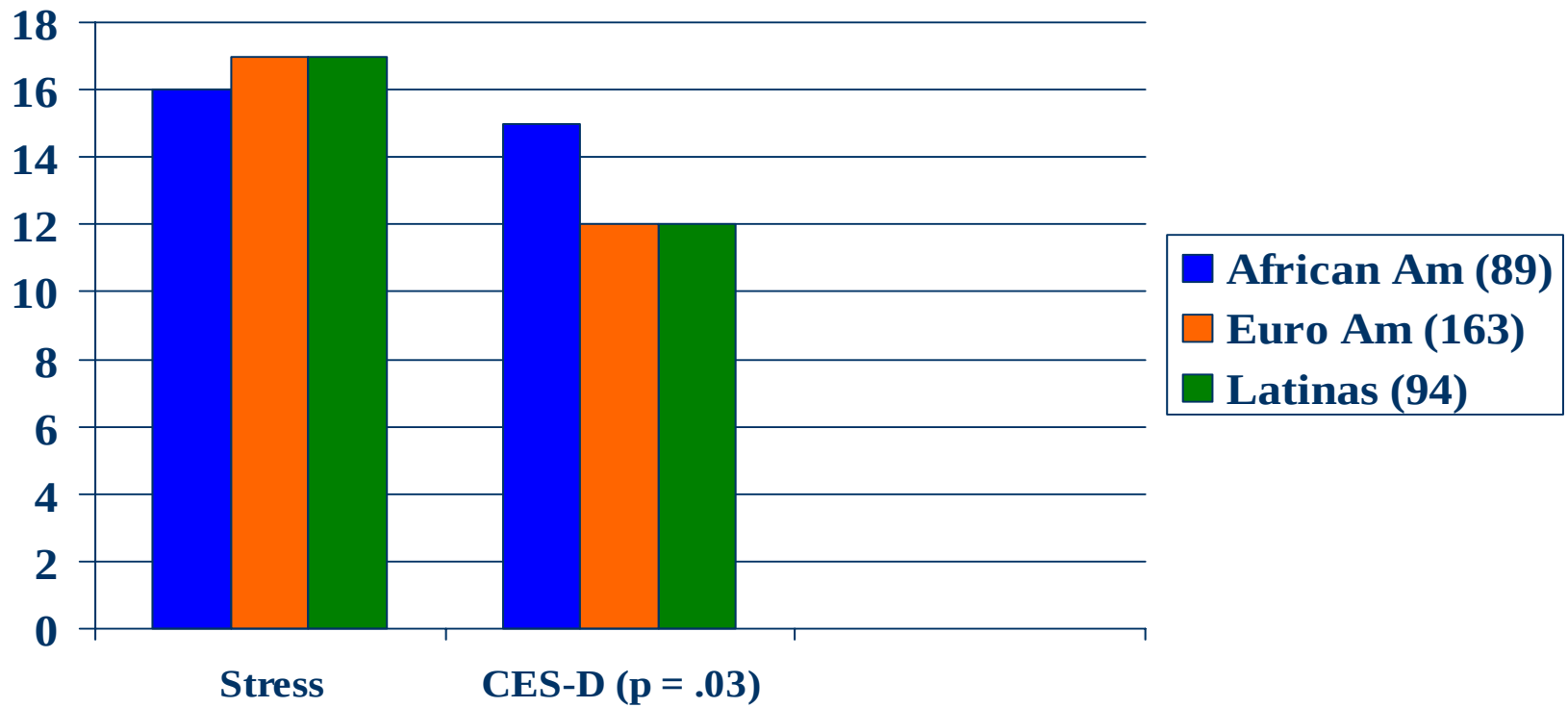
Demographics (continued)

	African American (n = 89)	European American (n = 163)	Mexican/Central American (n = 94)
Birth Place: USA	95%	95%	58%
English as a second language			58%
Not currently employed	13%	15%	15%
Married/Partner	41%*	64%	72%
Completed High School	93%	96%	72%*
Have 1 or more children	59%	59%	76%*

Marital Satisfaction and Social Support - Time 1



Perceived Stress and Depressive Symptoms



Perceived sleep quality was not significantly different for:

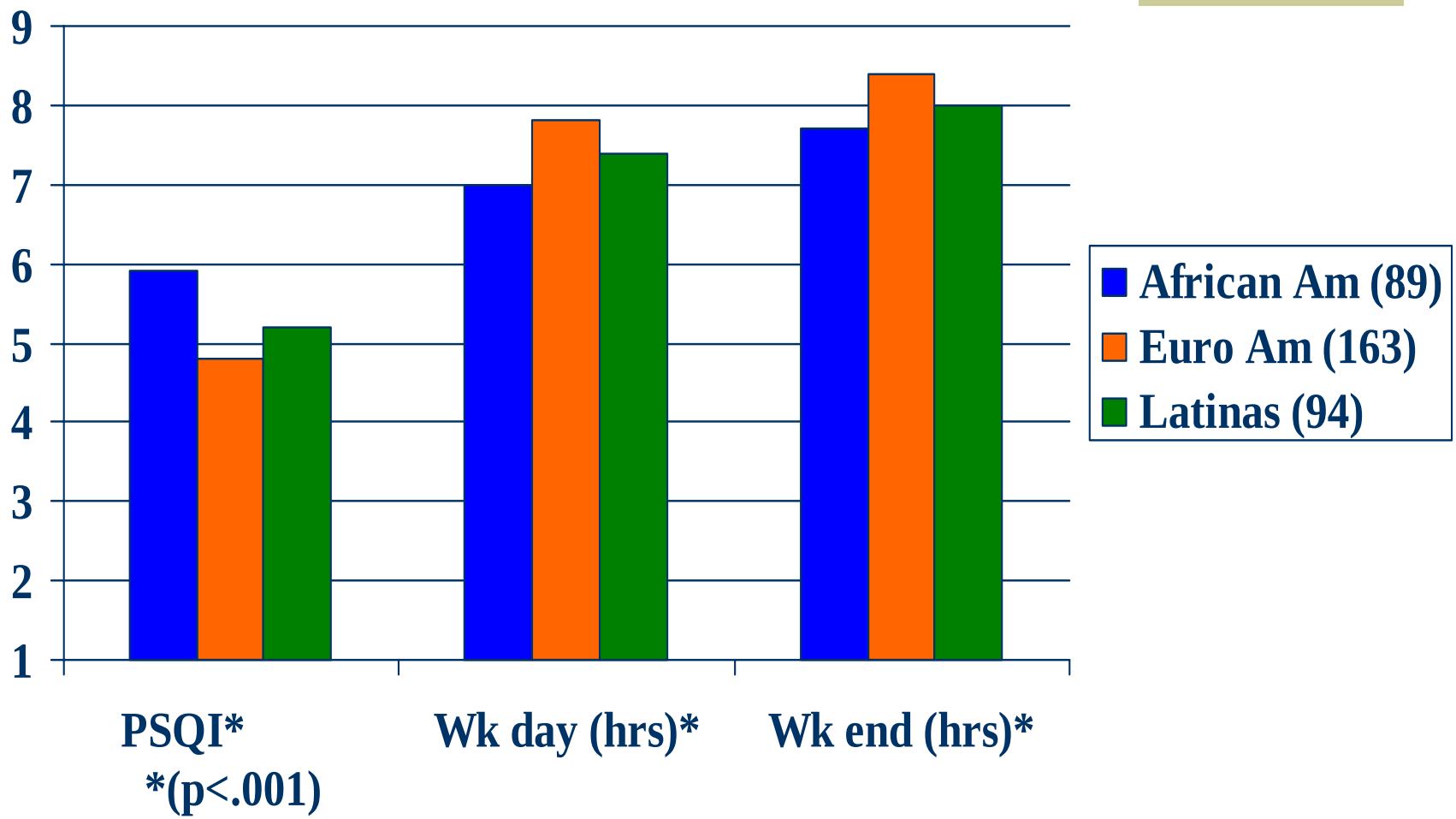
	PSQI
◆ Women with children (58%)	5.3 ± 3.2
◆ Women without children (42%)	4.8 ± 2.7
◆ Employed women (86%)	5.2 ± 3.0
◆ Unemployed women (14%)	5.1 ± 3.1
Exercise /no exercise	NS
Alcohol/caffeine	NS

Correlates of Perceived Sleep

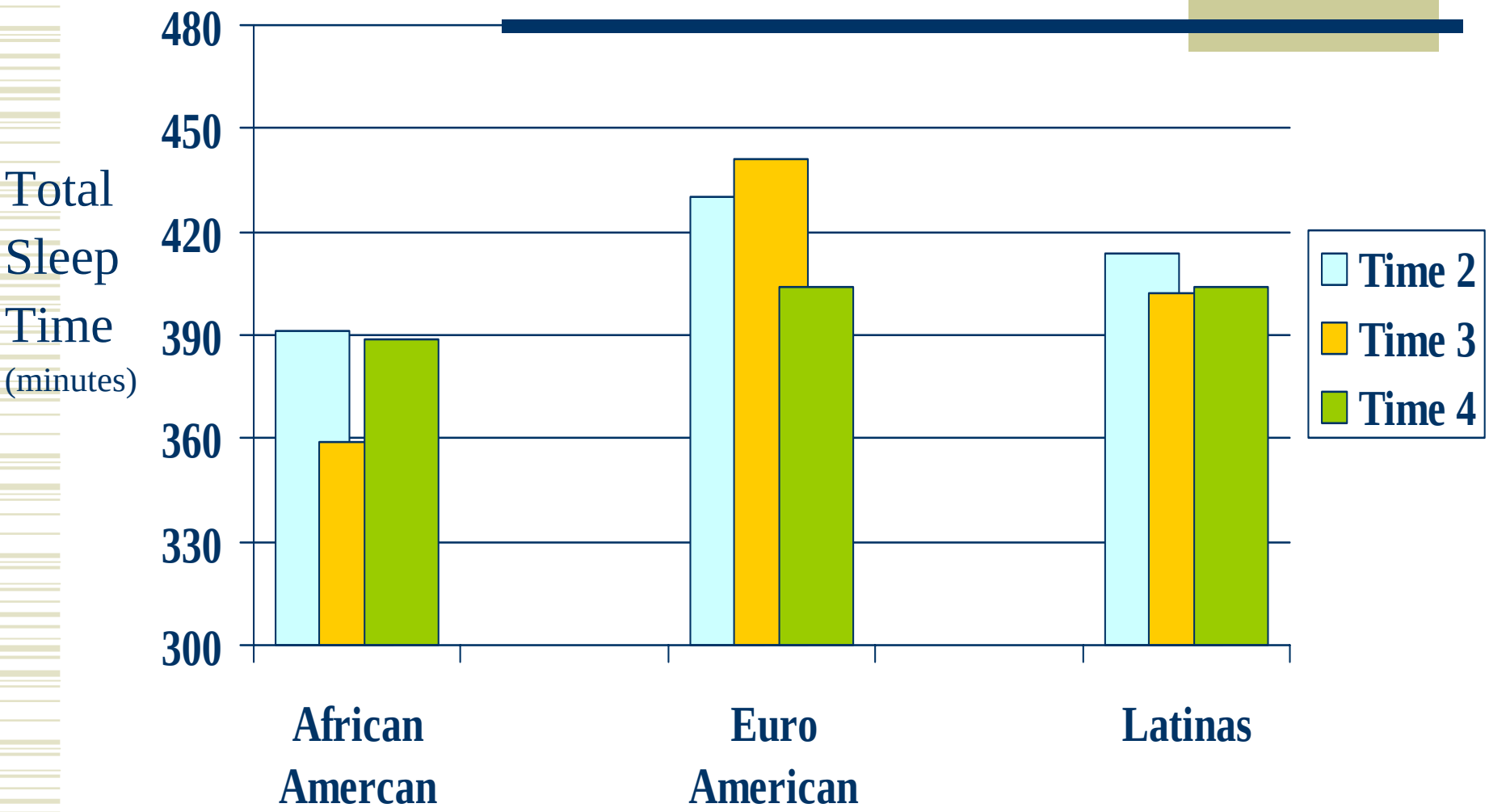
Sleep quality (PSQI) was significantly different for:

	PSQI
◆ Single women (47%)	5.7 ± 3.1 (p=.005)
Married/Partnered Women	4.8 ± 3.0
◆ Smokers (22%)	5.7 ± 3.1 (p= .01)
Non-smokers	4.8 ± 2.6
◆ At risk for depression (29%)	7.4 ± 3.5 (p<.001)
Not at risk for depression	4.2 ± 2.2
◆ African Americans	

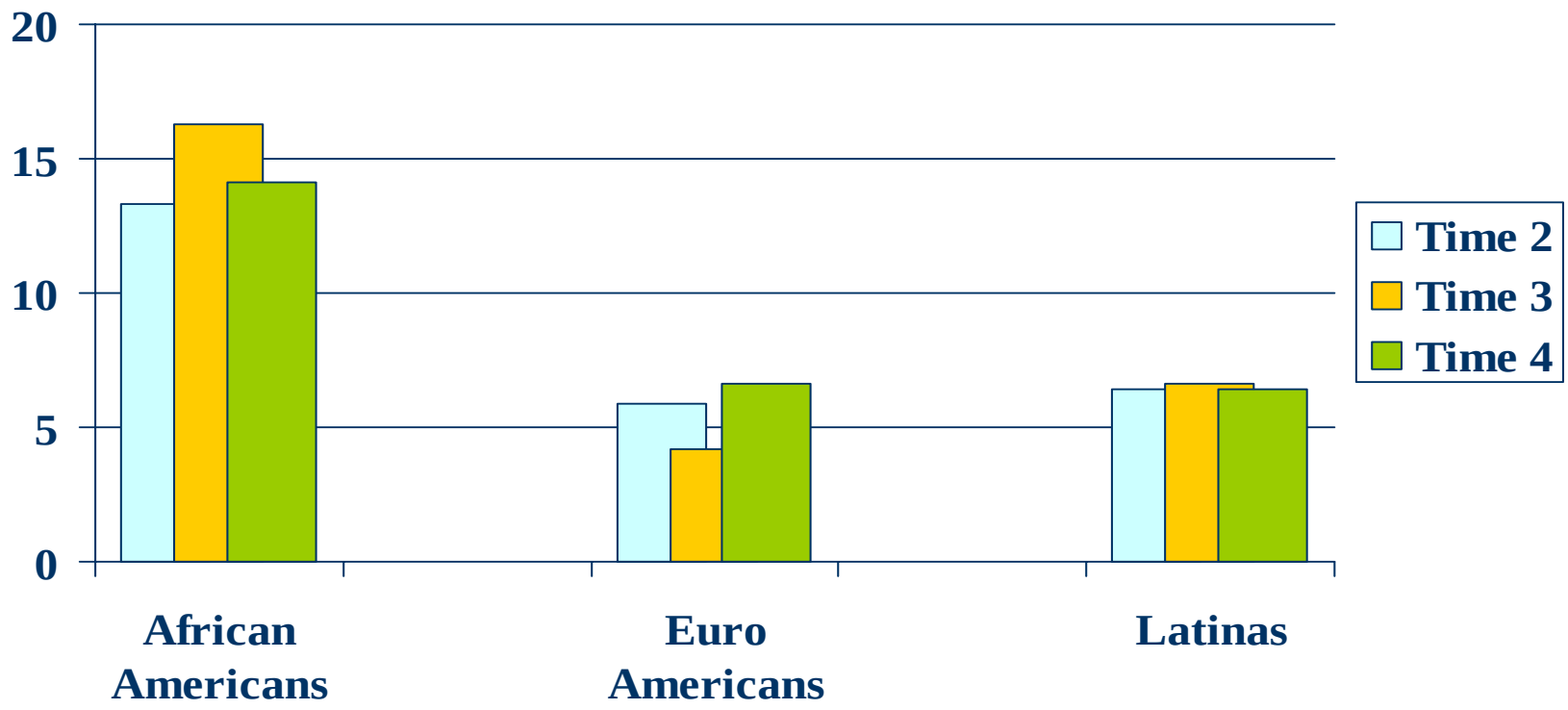
Midlife Women: Subjective Sleep Measures



Midlife Women: Objective Measures



Wrist Actigraphy
Wake After Sleep Onset (%)



Correlates of Perceived Sleep Quality (Times 1-3)

Sleep quality (PSQI) was significantly related to:

	Pearson r
❖ depressive symptoms	.62 to .75
❖ stress perception	.48
❖ Body mass index	.26
❖ Follicle Stim. hormone	.12 (p=.022)

A Bio-Psycho-Social Framework for Predicting Sleep Problems in Midlife Women

- **Biological Factors** 1%
  - Age/FSH
  - Body weight/diet
  - Smoking
  - Exercise *
- **Psychological Factors** 30%
  - Depression*
  - Stress
- **Social factors** 4%
  - Supportive relations
  - Multiple roles (wife, mother, employee)
  - Ethnicity*
  - Education*

→ **Sleep**

Complaints

Conclusion

Rather than attributing menopausal sleep problems to the absence of estrogen, other pre-existing factors:

- **Biological (diet, exercise, alcohol/caffeine, diabetes),**
- **Psychological (depression, perceived stress), or**
- **Social (poor relationships)**

are more likely to play a major role