CROSS-SECTIONAL ANALYSIS OF GLYCEMIC STATUS ASSOCIATED WITH SLEEP DURATION/QUALITY IN ASIAN AMERICANS USING NHANES 2011-2016

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Introduction

- Type II Diabetes is a chronic metabolic condition that manifests in the form of elevated blood sugar, which can lead to the onset of serious comorbidities. [1] Sleep duration and quality are known risk factors for elevated glycemic levels. [2]
- Studies in Asia have shown that Asians may be more susceptible to developing diabetes at a lower BMI, due to having higher levels of visceral fat. [3]
- Extensive amount of research has been conducted on the relationship between sleep and diabetes, however, research has not been at pace concerning Asian Americans.
- Engel's Biopsychosocial Model was used to understand the relationship among glycemic status, sleep behaviors, and Asian American culture. [4]
- The aim of this study is to investigate whether the relationship between sleep and glycemic levels differ between Asian Americans and Asians.

Study Objective

- The proposed study will investigate the association between sleep duration/quality and elevated glycemic levels among Asian Americans in the United States.

Methods

- Data came from the NHANES (2011-2016), using complex survey design with jackknife resampling approach.
- Hemoglobin A1c levels were used to define diabetes, prediabetes, and normative status.
- Sleep duration was stratified into 4 groups; Very Short Sleep (<6 Hours) (VSSD); Short Sleep (6-7 Hours) (SSD); Normative Sleep (7-8 Hours) (NSD); Long Sleep (>8 Hours) (LSD).
- Sleep duration was stratified as Normal (NSQ) and Poor Sleep Quality (PSQ)
- Stepwise logistic regression was used to model diabetes by sleep duration/quality, adjusted for age, sex, marital status, citizenship status, BMI, physical activity, alcohol, smoking, and hypertension.
- All statistical analyses and figures were conducted using STATA 15.0 and Graph Pad Prism 8.0.

Results

- In total 1,725 Asian participants were included in this analysis. The mean age of the analytic sample was 48 years old.
- Roughly 51% of the sample were measured to be at normal BMI.
- Proportion of diabetes and prediabetes in Asian Americans was estimated at 16% and 31%, respectively.
- Of the sample, 51% had NSD/NSQ, 9.6% had LSD/NSQ, 6.7% had NSD/PSQ, and 2.4% had VSSD/PSQ.
- Asian Americans with LSD/NSQ, NSD/PSQ, and VSSD/PSQ were found to have 2.3, 2.8 and 3.1 higher odds of having diabetes than those who had NSD/NSQ, respectively.

Table 1. *Sociodemographic, behavioral, and health information of Participants in the U.S NHANES (2011-2016)* N = 1,725

Characteristic	N (%)
Age (mean) (years)	48
Sex	
Male	824 (45.00)
Female	901 (55.00)
Diabetes	
No	1009 (84.00)
Yes	216 (16.00)
Pre-Diabetes	
No	1009 (69.00)
Yes	500 (31.00)
Sleep Duration & Quality	
NSD (7-8 Hours) & NSQ	870 (51.00)
VSSD (≤5 Hours) & NSQ	100 (5.50)
SSD (5-7 Hours) & NSQ	354 (20.00)
LSD (>8 Hours) & NSQ	153 (9.60)
NSD (7-8 Hours) & PSQ	112 (6.70)
VSSD (≤5 Hours) & PSQ	47 (2.40)
SSD (5-7 Hours) & PSQ	51 (3.00)
LSD (>8 Hours) & PSQ	37 (2.40)
Citizenship status	
US Citizen	1103 (63.00)
Non-US Citizen	619 (37.00)
Body Mass Index	
Normal	918 (54.00)
Underweight	50 (2.90)
Overweight	533 (31.00)
Obese	203 (13.00)
Blood Pressure	
Normal	866 (56.00)
Elevated	288 (18.00)
Stage one	199 (13.00)
Stage two	211 (13.00)
Physical Activity	
None	1,339 (78.00)
Moderate	248 (14.00)
Vigorous	138 (7.40)

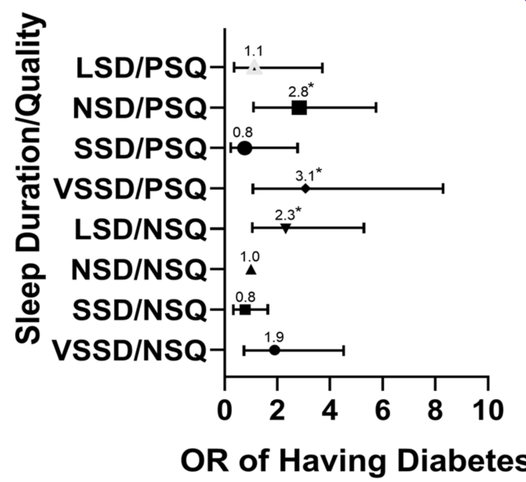

Figure 1. Odds Ratio and 95% Confidence Intervals of Type II Diabetes among Sleep Duration/Quality Measures Relative to Normal Sleep Duration/Normal Sleep Quality

Discussion

- Findings confirmed that adverse sleep duration and quality is associated with higher glycemic status in Asian Americans.
- Results align with extant literature. Confirmed findings in Asian and US studies which found that poor quality sleep and adverse sleep duration were linked to higher glycemic levels.
- Notable limitations are small analytic sample size, sleep quality measurements varied across cycles, and self-report/social-desirability bias.
- Glycemic status based on a combination of sleep duration and quality provides an outlook of the synergistic impact on glycemic levels.

Conclusion

- Findings have shown that NSD/PSQ, LSD/NSQ, and VSSD/PSQ increased odds of having diabetes among Asian Americans.
- These results align with previous literature and examine a subgroup that has not been at the focal point of social diabetes research.
- Given the findings and the need to better understand health disparities among diverse populations. There is a conclusive need for more sampling of Asian Americans.
- This study is essential for highlighting the association between sleep and diabetes among Asian Americans.

Literature Cited

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