

# Dietary Patterns and Sleep-Related Impairment in a Cohort Community Physicians

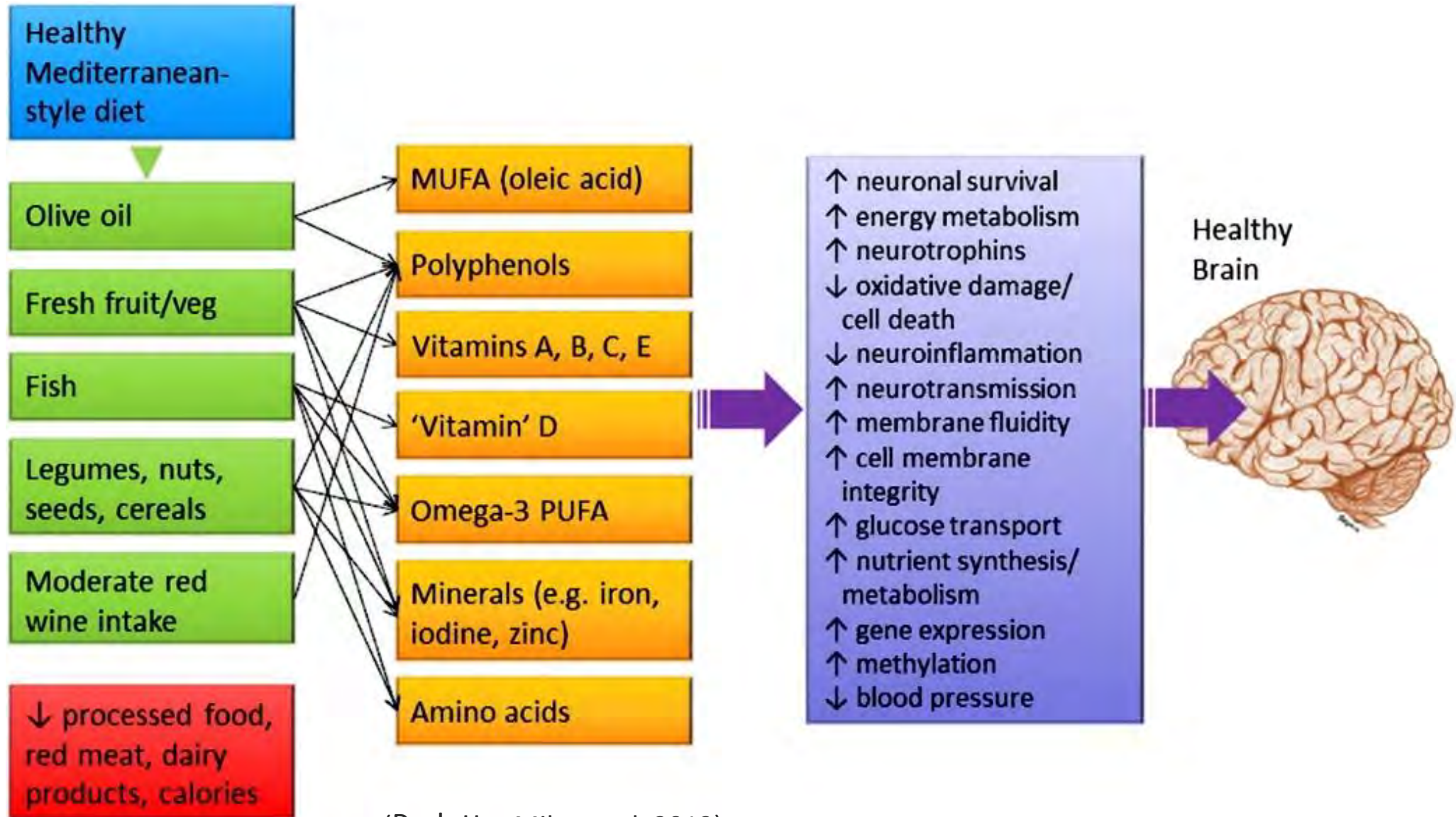
Maryam S. Hamidi, PhD

Associate Director of Scholarship and Health Promotion  
Stanford Medicine WellMD Center

# Disclosure

Maryam S. Hamidi has no conflicts of interests or relationships with commercial interests.

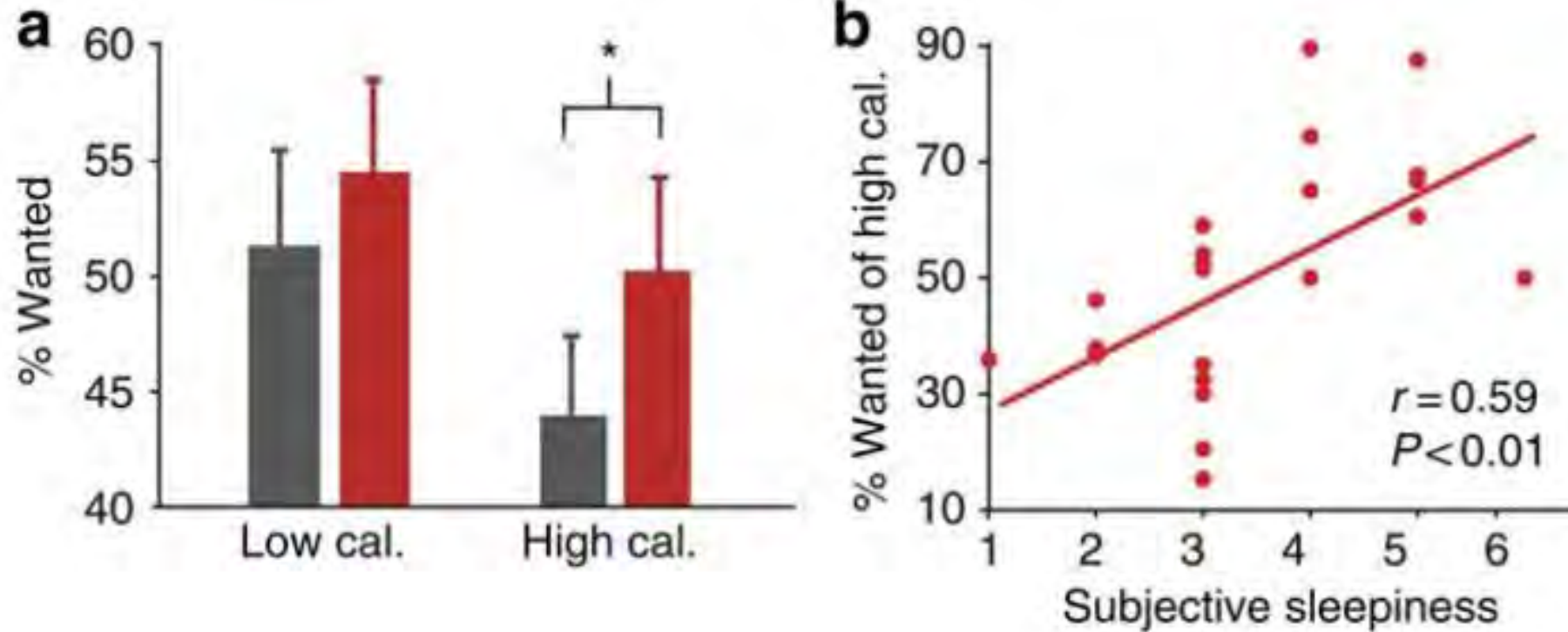
# Examples of Dietary Factors Affecting Brain



(Parletta, Milte et al. 2013)

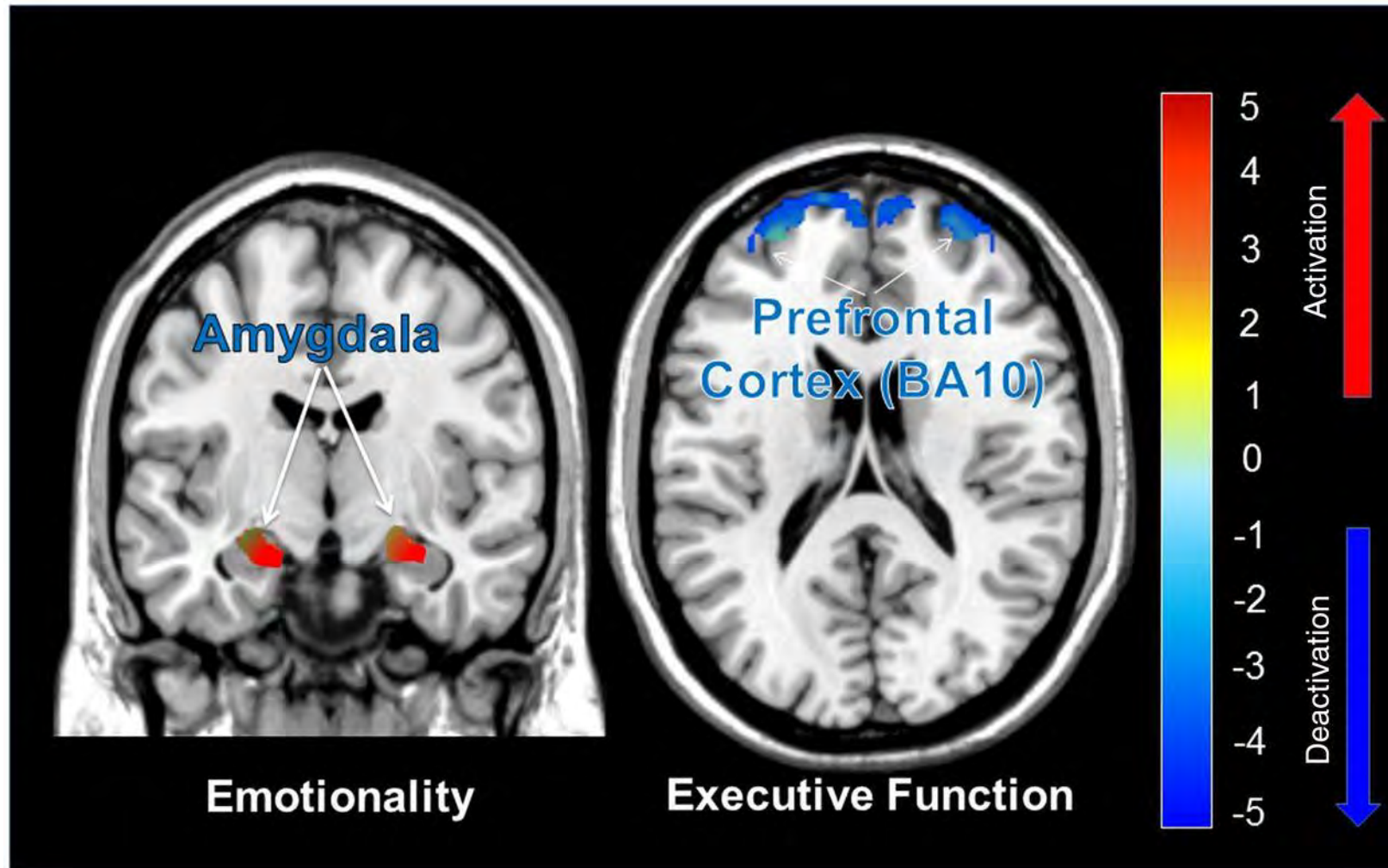
# Consequences of Sleep Deprivation on Food Desirability

Self-reported hunger levels were not different in the sleep-rested and sleep deprivation session

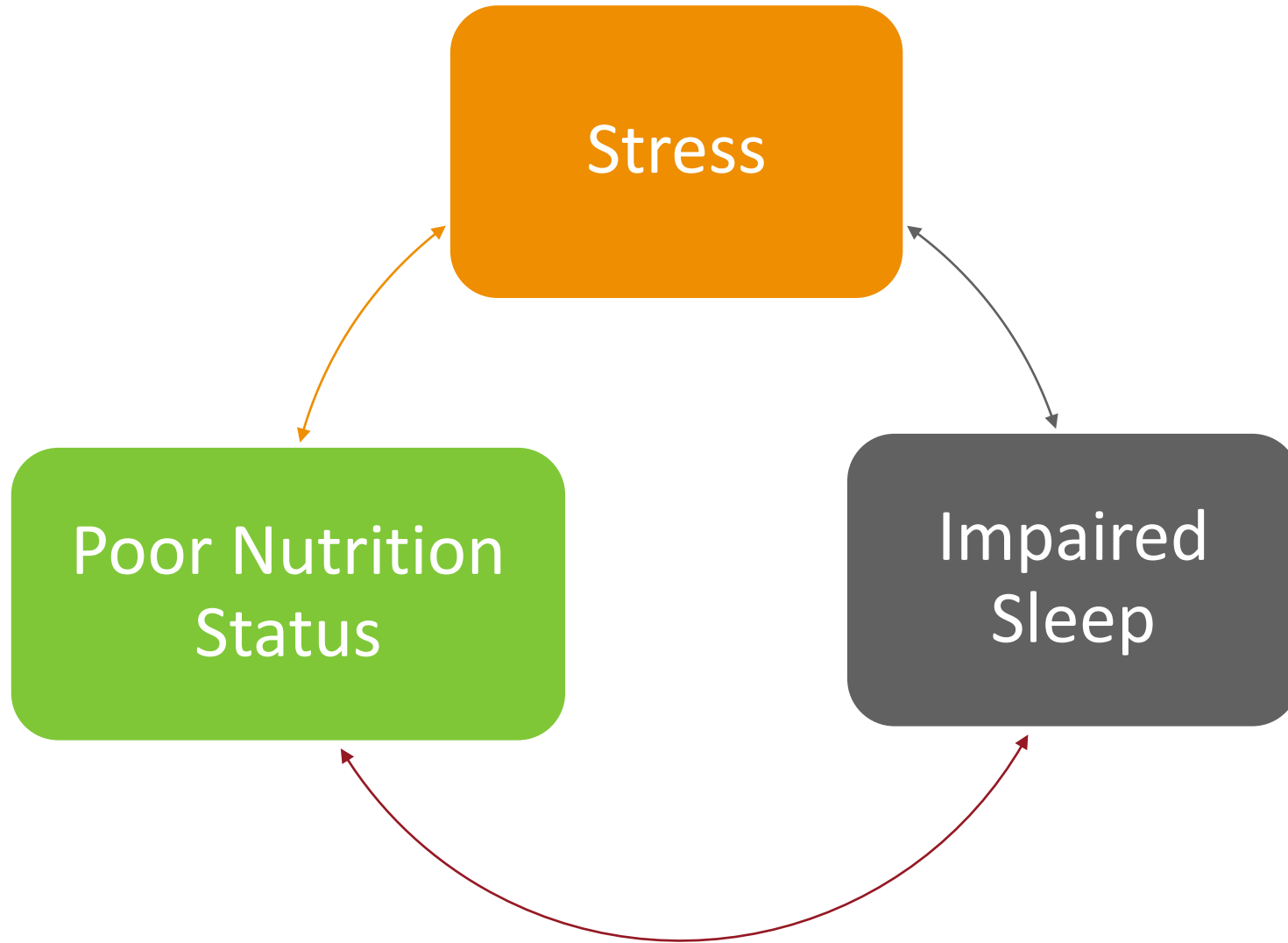


(Greer, Goldstein et al. 2013)

In response to viewing pictures of high-calorie foods, compared with low-calorie foods and nonfood control images, women with more chronic stress and hypocortisolemia showed enhanced activation in brain regions linked to emotionality (e.g., amygdala) and deactivation in executive brain regions (e.g., Brodmann's area 10).



Scherr RE et al. Adv Nutr 2017;8:113-125



# Objective

To assess the associations between dietary patterns and sleep-related impairment in a cohort of community physicians

# Outcome

NIH-PROMIS Sleep-Related Impairment:

“Self-reported perceptions of alertness, sleepiness, and tiredness during usual waking hours, and the perceived functional impairments during wakefulness associated with sleep problems or impaired alertness.”



# Study Design

- Cross-sectional observational study
- Data from
  - The 2015 Stanford Provider Wellness Survey (98% response rate)
  - 245 community physicians

# Sample Description

		<b>Frequency</b>	<b>Percent</b>
<b>Gender</b>	Male	113	46.3
	Female	131	53.7
<b>Age (y)</b>	<40	52	21.5
	40-49	82	33.9
	50-59	60	24.8
	≥60	48	19.8
<b>Physically Active (150 min/week)</b>	Yes	99	41.4
	No	140	58.6
<b>Drinks Alcohol</b>	Yes	148	60.7
	No	96	39.3

# Sample Description

	<b>Range</b>	<b>Mean</b>	<b>SD</b>	<b>Median</b>
<b>Burnout</b>	1-5	1.9	0.7	1.9
<b>Work Hours (hours/week)</b>	0-100	48.6	16.9	46.0
<b>Sleep-Related Impairment</b>	8-40	16.4	4.8	15.0

SD: Standard Division

# Results

## Spearman Correlations (n=245)

	Green Leafy Vegetables	Other Non-Starchy Vegetables	Legumes	Nuts	Poultry	Added Sugars	Saturated Fat
I had a hard time getting things done because I was sleepy			-0.16	-0.13		<b>0.20</b>	0.14
I felt alert when I woke up							
I felt tired			<b>-0.21</b>	-0.14		0.17	
I had problems during the day because of poor sleep	-0.18	-0.18	-0.17		-0.14		
I had a hard time concentrating because of poor sleep		-0.17				0.15	
I felt irritable because of poor sleep	-0.13	-0.18	-0.16				
I was sleepy during the daytime	-0.17	-0.14	-0.18				0.14
I had trouble staying awake during the day						0.13	
Total sleep-related impairment score		-0.18	-0.19			0.19	

p-value <0.05

No correlations between sleep impairment items and weekly consumption of berries, fish, red meat, cheese, alcohol, whole grain or fast food.

# Identification of Dietary Factors

	Mediterranean Diet	High Protein Low Carb Diet	Western Diet
Fast Food	-0.48		
Red Meat	-0.30	0.65	
Added Sugars	-0.21		0.61
Cheese	0.23		0.66
Fish	0.25	0.68	
Legumes	0.55	-0.24	
Nuts	0.57		
Berries	0.60		
Green Leafy Vegetables	0.61	0.24	
Other Non-Starchy Vegetables	0.74		
Whole Grains		-0.32	0.22
Poultry		0.57	
Saturated Fat			0.71

Factor analysis with Varimax rotation

Eigenvalue > 1.25 criterion

Absolute factor loadings > 0.20 for each food item were used to derive dietary patterns

# Unadjusted Analysis

	<b>B (95% CI)</b>	<b>p-value</b>
<b>Mediterranean Diet</b>	-0.72 (-1.34, -0.11)	0.02
<b>High Protein Low Carb Diet</b>	-0.25 (-0.86, 0.37)	0.43
<b>Western Diet</b>	0.79 (0.17, 1.40)	0.01

B: Parameter estimate, SE: Standard Error, CI: Confidence Interval

# Multivariate Analysis

## Outcome: Sleep-Related Impairment

	<b>B (95% CI)</b>	<b>p-value</b>
<b>Mediterranean Diet</b>	-0.22 (-0.80,0.37)	0.46
<b>High Protein Low Carb Diet</b>	0.14 (-0.42, 0.69)	0.62
<b>Western Diet</b>	<u>0.69 (0.12,1.25)</u>	<u>0.02</u>
<b>Men vs Women</b>	-0.43 (-1.69, 0.83)	0.50
<b>&lt;40 vs 60+ years</b>	1.25 (-0.56, 3.06)	0.18
<b>40-49 vs 60+ years</b>	1.29 (-0.37, 2.95)	0.13
<b>50-59 vs 60+ years</b>	0.80 (-0.93, 2.53)	0.36
<b>Work Hours</b>	0.03 (-0.01, 0.07)	0.10
<b>Physically Active vs Not</b>	-0.06 (-1.22, 1.11)	0.92
<b>Drinks Alcohol vs Not</b>	-0.99 (-2.17, 0.19)	0.10
<b>Burnout</b>	<u>3.44 (2.59, 4.30)</u>	<u>0.00</u>

# Western Dietary Pattern and Sleep Quality

- Shorter, lighter, less restorative sleep with more arousals, and increased daytime sleepiness (St-Onge, Mikic et al. 2016, St-Onge, Roberts et al. 2016; Lieberman, Wurtman et al. 1989)
- **Disrupted circadian rhythm** (Pivovarova O, et al, 2015)





# Mediterranean Dietary Pattern and Sleep Quality

- Optimal sleep duration and quality  
(Peuhkuri, Sihvola et al. 2012, Katagiri, Asakura et al. 2014, Noorwali, Cade et al. 2018)
- $1.5 \text{ g kg}^{-1} \text{ d}^{-1}$  of lean protein associated with better overall sleep  
(Zhou, Kim et al. 2016)



# Conclusions

- Diets that are high in carbohydrates, sugar and saturated fat may be contributing to sleep-related impairment in community physicians.



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