Sleep and Dietary Habits in Undergraduate College Students

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BACKGROUND

- Many studies have found that insufficient sleep duration impacts the quality of food choices, such as increased consumption of calorie-dense foods and high-fat intake (1).

- **Insufficient sleep** is also associated with other poor health choices, such as increased alcohol intake, caffeine consumption, more sedentary behavior (2) , smoking (3), and others. All of these lifestyle factors may contribute to sub-optimal cardiovascular health.

- Undergraduate college students often report poor sleeping habits, such as short sleep duration and poor sleep quality (4, 5).

- However, the relation between diet, lifestyle factors, and other sleep metrics, such as sleep efficiency and sleep timing, are not well defined in college students.

- **Study Aim:** To characterize the association between habitual sleep metrics and dietary habits in healthy undergraduate college students.

METHODS

- **Motionlogger**: Habitual sleep was objectively assessed via wrist-worn actigraphy for 14 consecutive days and nights. The motionlogger data was collected while additionally utilizing a sleep diary for each night that the actigraph was worn.

- **Sleep Efficiency:** is the percentage of time spent asleep while in bed. A "good" sleep efficiency is typically considered greater than 85% (6).

- **Sleep Timing:** quantified using the average time of awakening, or **"wake onset"**.

- **Dietary Habits Assessment:** food logs were filled out by each participant to display normal eating habits for 3 days. Food logs were used to indicate average macronutrient intake and breakdown.

- **Heart Health Score:** *My Life Check (American Heart Association),* is an online tool that calculates a heart health score on a scale of 1-10 using *Simple 7.* Simple 7 is characterized as the 7 risk factors that people can improve through lifestyle changes to help achieve ideal cardiovascular health.
- The 7 factors that are used to evaluate a participant's heart health score is dependent upon the following factors:

    1. Blood pressure
    2. Cholesterol
    3. Fasting blood glucose
    4. Physical activity
    5. Diet
    6. Weight (BMI)
    7. Smoking

METHODS & RESULTS

FIGURE 1: **Motionlogger.** Image of the Motionlogger. The Motionlogger measures the frequency and intensity of movement, within 2 weeks of recording time. The high sensitivity documents bouts of arousal during a sleep period (Ambulatory Monitoring, Inc.)

FIGURE 2: Example Food Record. Image of a sample food log to show to each participant of how to keep accurate records. Each participants filled out a food record for 3 days of normal eating, one of which was a weekend day.

Table 1: Subject Characteristics (Mean ± Standard Error)

N	30
Age (years)	20.3 ± 0.2
Sex	12M/18W
Resting Systolic BP (mmHg)	116 ± 2
Resting Diastolic BP (mmHg)	68 ± 1
BMI	23.6 ± 0.4

FIGURE 3: Average Sleep Efficiency and Heart Heath Score. Participants with a higher sleep efficiency percentage tend to achieve a higher Heart Health Score.

FIGURE 4: Average Sleep Efficiency and Average Fat Consumption . Participants with a higher sleep efficiency percentage tend to consume less grams of fat on average per day.

FIGURE 5: Average Wake Onset and Average Fruit and Vegetable Intake. Participants that consume more servings fruits and vegetables per day tend to have a earlier wake onset.

FIGURE 6: Average Wake Onset and Average Cholesterol Intake. Participants that consume higher milligrams of cholesterol per day tend to have a later wake onset.
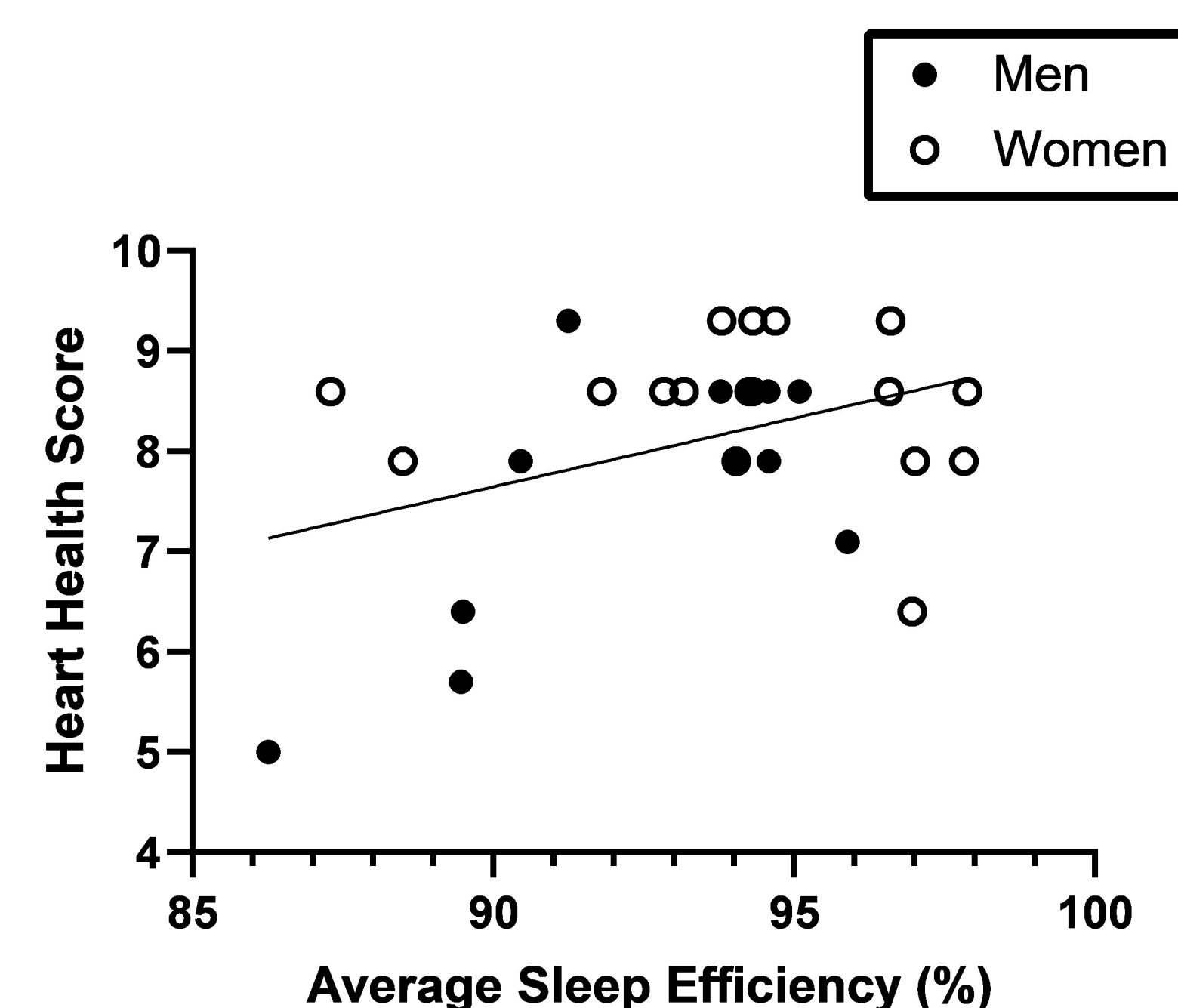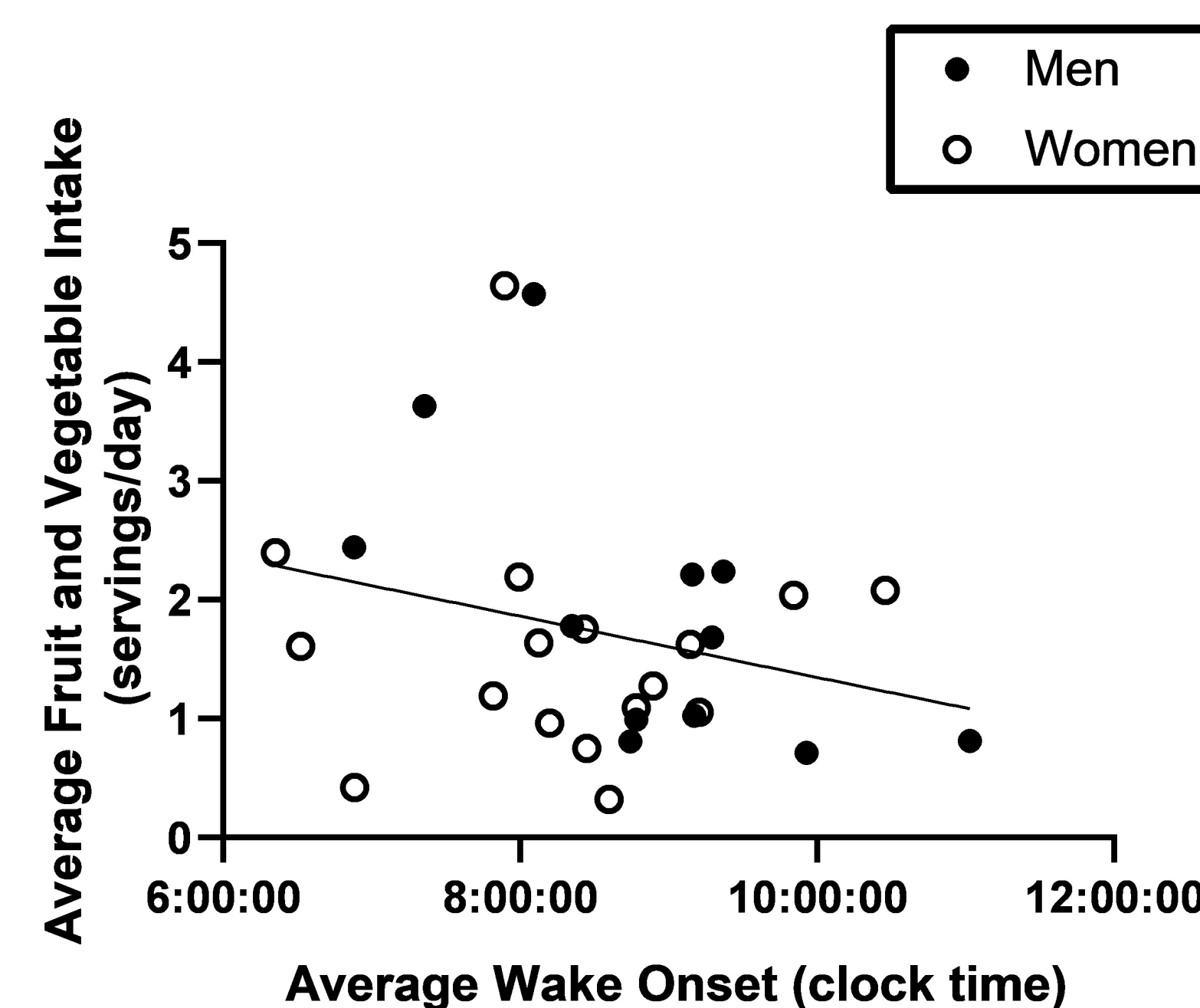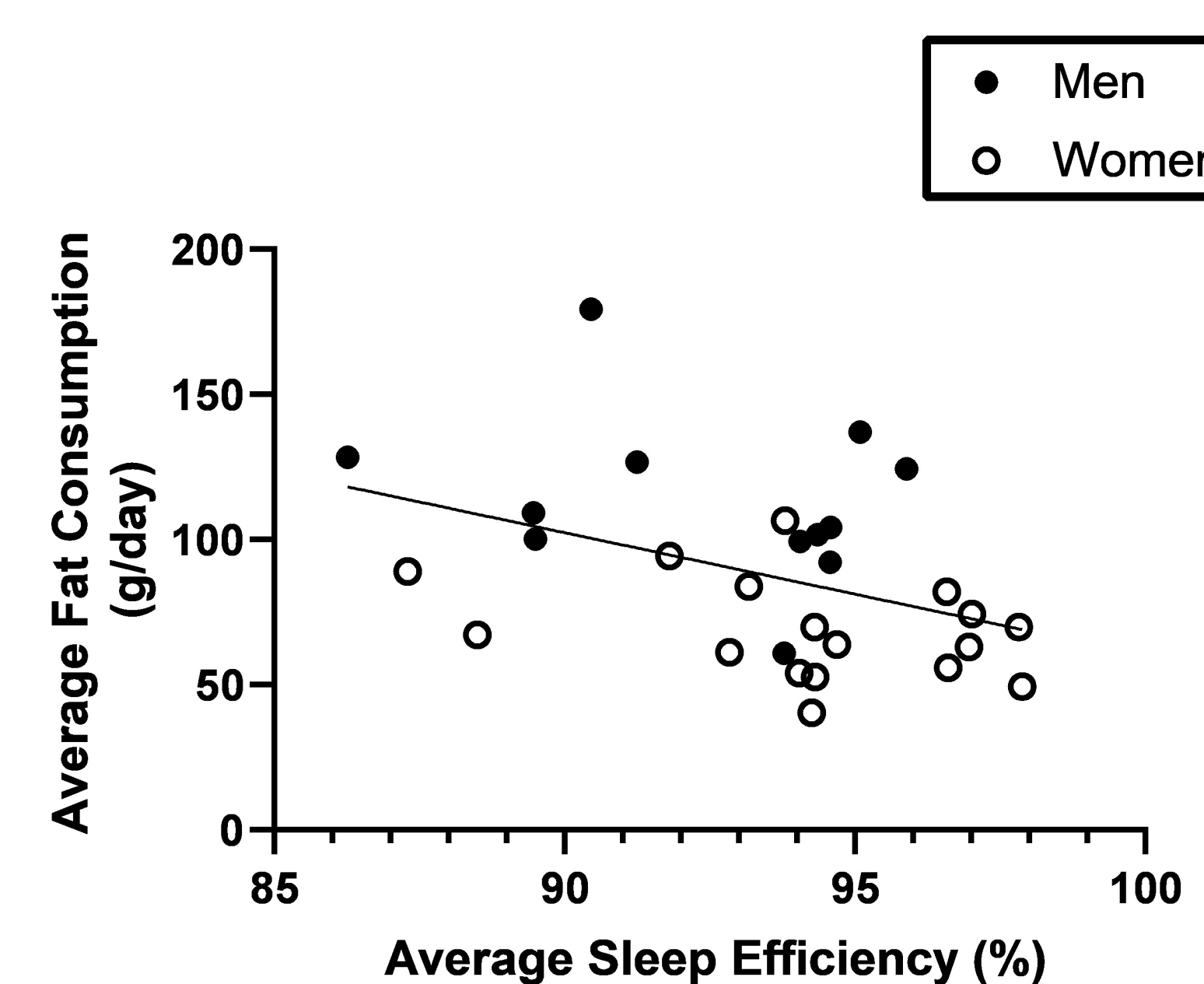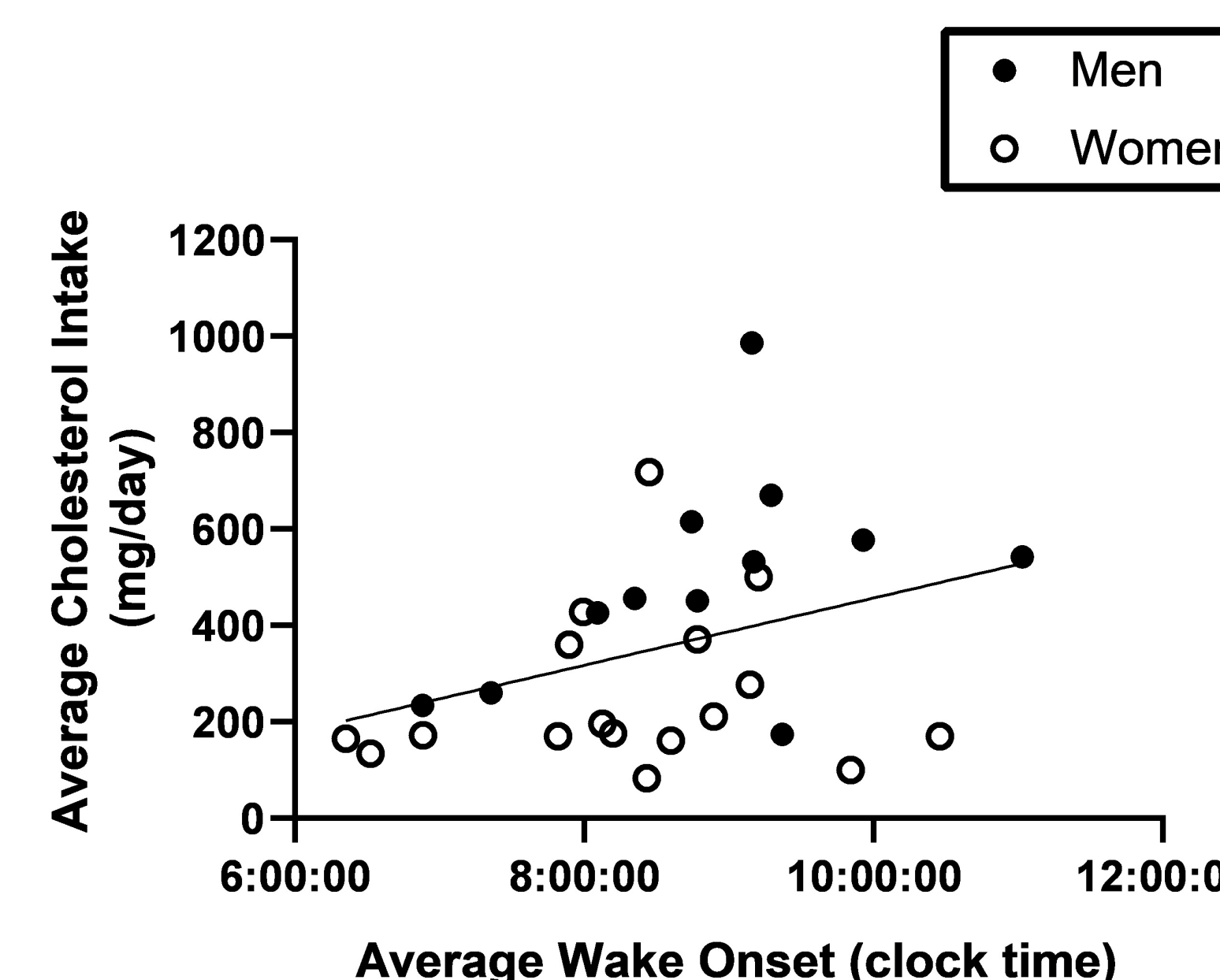

DISCUSSION

- Quality sleep is essential for good health. Insufficient sleep is associated with negative health consequences (7). The results show that factors beyond short sleep duration, including a lower average sleep efficiency and a later wake onset may also be associated with other poor health choices.

- A healthier diet could enhance the duration and quality of sleep, and likewise, getting consistent, high quality sleep could aid in a better diet.

- Sleep efficiency (SE) is described as the percentage of time in bed that is spent asleep, and considered to represent sleep quality (8). The results show that the less sleep acquired, or a lower sleep efficiency, the more likely an individual will consume foods higher in calories, fats, and cholesterol.

- On average, a healthier diet was associated with in a earlier wake onset. Individuals who consumed more fruits and vegetables had an earlier wake onset than those who consumed fewer vegetables. Research shows that diets that contain higher amounts of fruits and vegetables can help protect you against cardiovascular disease (9).

- Results show that individuals that consumed higher amounts of cholesterol had a later average wake onset. This relationship relates to a poorer diet and sleep duration. Oversleeping or not getting enough sleep is often related to poor eating habits.

- Overall, the results suggest that better sleep quality and less "sleeping in" are associated with better dietary habits and lifestyle in college students.

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