

# Plasma DHA Is Related to Sleep Timing and Duration in a Cohort of Mexican Adolescents

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## ABSTRACT

### Background

Delayed sleep timing and short sleep duration represent a significant public health burden in adolescents. Whether intake of nutrients affects the pineal gland, where sleep/wake cycles are regulated, remains unclear.

### Objectives

In a cross-sectional analysis, we investigated whether plasma concentrations of DHA and arachidonic acid (AA), long-chain fatty acids that can be obtained through diet, were related to sleep timing and duration in adolescents.

### Methods

The study population included 405 Mexico City adolescents (mean age  $\pm$  SD = 14.2  $\pm$  2.1 y; 48% males) who took part in a 2015–2016 follow-up visit as a part of an ongoing cohort study. Fatty acid concentrations were measured in plasma using GLC, as a percentage of total fatty acids. Sleep midpoint and duration were assessed with 7-d wrist actigraphy. We categorized DHA and AA plasma concentrations into quartiles (Q1–Q4; Q4 = highest fatty acids). We conducted cross-sectional linear regression analysis with sleep characteristics as separate outcomes and quartiles of DHA and AA as exposures, adjusting for sex, age, and BMI z-scores.

### Results

Mean  $\pm$  SD plasma DHA (as percentage of total fatty acids) was  $1.2 \pm 0.4\%$ , whereas mean  $\pm$  SD plasma AA was  $6.2 \pm 1.5\%$ . In adjusted analysis, higher plasma DHA was linearly associated with longer sleep duration on the weekends; to illustrate, those in Q4 compared with Q1 had 32 min longer duration (95% CI: 7, 57;  $P$  trend = 0.005). Higher DHA was also associated with earlier sleep timing during weekdays and weekends, although in a nonlinear fashion. The largest difference was a 0.75-h (45-min) later sleep midpoint in Q2 compared with Q4 (95% CI: 0.36, 1.14).

## Conclusions

Plasma DHA was associated with earlier sleep timing and longer weekend sleep duration in Mexican adolescents. Whether DHA supplementation improves sleep in adolescent populations deserves consideration in randomized trials.

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**Keywords:** docosahexaenoic acid, arachidonic acid, sleep quality, actigraphy, Mexico

**Topic:** body mass index procedure, fatty acids, diet, adolescent, arachidonic acid, mexico, plasma, wrist, sleep, weekend, linear regression, actigraphy, sleep duration

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