

Reducing total calories may be more effective for weight loss than intermittent fasting

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The frequency and size of meals was a stronger determinant of weight loss or gain than the time between first and last meal, according to new research published today in the *Journal of the American Heart*

Association.

According to the senior study author Wendy L. Bennett, M.D., M.P.H., an associate professor of medicine at Johns Hopkins University School of Medicine in Baltimore, although 'time-restricted eating patterns'—known as intermittent fasting—are popular, rigorously designed studies have not yet determined whether limiting the total eating window during the day helps to control [weight](#).

This study evaluated the association between time from the first meal to last meal with weight change. Nearly 550 adults (18 years old or older) from three [health systems](#) in Maryland and Pennsylvania with [electronic health records](#) were enrolled in the study. Participants had at least one weight and height measurement registered in the two years prior to the study's enrollment period (Feb.-July 2019).

Overall, most participants (80%) reported they were white adults; 12% self-reported as Black adults; and about 3% self-identified as Asian adults. Most participants reported having a [college education](#) or higher; the average age was 51 years; and the average body mass index was 30.8, which is considered obese. The average follow-up time for weight recorded in the electronic health record was 6.3 years.

Participants with a higher body mass index at enrollment were more likely to be Black adults, older, have Type 2 diabetes or high blood pressure, have a lower education level, exercise less, eat fewer fruits and vegetables, have a longer duration from last mealtime to sleep and a shorter duration from first to last meal, compared to the adults who had a lower body mass index.

The research team created a [mobile application](#), Daily24, for participants to catalog sleeping, eating and wake up time for each 24-hour window in real time. Emails, text messages and in-app

notifications encouraged participants to use the app as much as possible during the first month and again during "power weeks"—one week per month for the six-month intervention portion of the study.

Based on the timing of sleeping and eating each day recorded in the mobile app, researchers were able to measure:

- the time from the first meal to the last meal each day;
- the time lapse from waking to first meal; and
- the interval from the last meal to sleep.

They calculated an average for all data from completed days for each participant.

The data analysis found:

- Meal timing was not associated with weight change during the six-year follow-up period. This includes the interval from first to last meal, from waking up to eating a first meal, from eating the last meal to going to sleep and total sleep duration.
- Total daily number of large meals (estimated at more than 1,000 calories) and medium meals (estimated at 500-1,000 calories) were each associated with increased weight over the six-year follow up, while fewer small meals (estimated at less than 500 calories) was associated with decreasing weight.
- The average time from first to last meal was 11.5 hours; average time from wake up to first meal measured 1.6 hours; average time from last meal to sleep was 4 hours; and average sleep duration was calculated at 7.5 hours.
- The study did not detect an association meal timing and weight change in a population with a wide range of body weight.

As reported by Bennett, even though prior studies have suggested

intermittent fasting may improve the body's rhythms and regulate metabolism, this study in a large group with a wide range of body weights did not detect this link. Large-scale, rigorous clinical trials of intermittent fasting on long-term weight change are extremely difficult to conduct; however, even short-term intervention studies may be valuable to help guide future recommendations.

Although the study found that meal frequency and total calorie intake were stronger risk factors for weight change than meal timing, the findings could not prove direct cause and effect, according to lead study author Di Zhao, Ph.D., an associate scientist in the division of cardiovascular and clinical epidemiology at Johns Hopkins Bloomberg School of Public Health.

Researchers note there are limitations to the study since they did not evaluate the complex interactions of timing and frequency of eating. Additionally, since the study is observational in nature, the authors were unable to conclude cause and effect. Future studies should work toward including a more diverse population, since the majority of the study's participants were well-educated white women in the mid-Atlantic region of the U.S., the authors noted.

Researchers also were not able to determine the intentionality of weight loss among study participants prior to their enrollment and could not rule out the additional variable of any preexisting health conditions.

According to the [American Heart Association's 2022 statistics](#), 40% of adults in the U.S. are obese; and the Association's current [diet and lifestyle recommendations](#) to reduce cardiovascular disease risk include limiting overall calorie intake, eating healthy foods and increasing physical activity.

The [2017 American Heart Association scientific statement: Meal Timing](#)

[and Frequency: Implications for Cardiovascular Disease Prevention](#) did not offer clear preference for frequent small meals or [intermittent fasting](#). It noted that irregular patterns of total caloric intake appear to be less favorable for the maintenance of body weight and optimal cardiovascular health. And, altering meal frequency may not be useful for decreasing body weight or improving traditional cardiometabolic risk factors.

Other co-authors of this study are Eliseo Guallar, M.D., Dr. P.H.; Thomas B. Woolf, Ph.D.; Lindsay Martin, M.A.; Harold Lehmann, M.D., Ph.D.; Janelle Coughlin, Ph.D.; Katherine Holzhauer, B.A.; Attia A. Goheer, Ph.D.; Kathleen M. McTigue, M.D., M.P.H., M.S.; Michelle R. Lent, Ph.D.; Marquis Hawkins, Ph.D.; and Jeanne M. Clark, M.D., M.P.H.

More information: Association of Eating and Sleeping Intervals With Weight Change Over Time: The Daily24 Cohort, *Journal of the American Heart Association* (2023). [DOI: 10.1161/JAHA.122.026484](https://doi.org/10.1161/JAHA.122.026484)

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