

JOURNAL OF THE ACADEMY OF NUTRITION AND DIETETICS



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Food for thought: If you eat and when you eat can impact your mortality

Skipping meals, fasting and eating meals too closely together may be linked with increased cardiovascular or all-cause mortality, researchers report in the Journal of the Academy of Nutrition and Dietetics

Philadelphia, November 22, 2022 – Eating only one meal per day is associated with an increased risk of mortality in American adults 40 years old and older, according to a [new study](#) in the [Journal of the Academy of Nutrition and Dietetics](#), published by Elsevier. Skipping breakfast is associated with higher risk of cardiovascular disease mortality and missing lunch or dinner with all-cause mortality. Even among individuals who eat three meals daily, eating two adjacent meals less than or equal to 4.5 hours apart is associated with a higher all-cause death risk.

“At a time when intermittent fasting is widely touted as a solution for weight loss, metabolic health, and disease prevention, our study is important for the large segment of American adults who eat fewer than three meals each day. Our research revealed that individuals eating only one meal a day are more likely to die than those who had more daily meals. Among them, participants who skip breakfast are more likely to develop fatal cardiovascular diseases, while those who skip lunch or dinner increase their risk of death from all causes,” noted lead author Yangbo Sun, MBBS, PhD, Department of Preventive Medicine, The University of Tennessee Health Science Center, Memphis, TN, USA. “Based on these findings, we recommend eating at least two to three meals spread throughout the day.”

The investigators analyzed data from a cohort of more than 24,000 American adults 40 years old and older who participated in the National Health and Nutrition Examination Survey (NHANES) between 1999 and 2014. An ongoing, nationally representative health survey of the non-institutionalized US population,

NHANES collects a wide range of health-related data to assess diet, nutritional status, general health, disease history, and health behaviors every two years. Mortality status and cause of the 4,175 deaths identified among this group were ascertained from the NHANES Public-use Linked Mortality File. The investigators observed a number of common characteristics among participants eating fewer than three meals per day (around 40% of respondents) -- they are more likely to be younger, male, non-Hispanic Black, have less education and lower family income, smoke, drink more alcohol, be food insecure, and eat less nutritious food, more snacks, and less energy intake overall.

“Our results are significant even after adjustments for dietary and lifestyle factors (smoking, alcohol use, physical activity levels, energy intake, and diet quality) and food insecurity,” said the study’s senior investigator Wei Bao, MD, PhD, Department of Epidemiology, College of Public Health, University of Iowa, Iowa City, IA, USA. He noted, “Our findings are based on observations drawn from public data and do not imply causality. Nonetheless, what we observed makes metabolic sense.”

Dr. Bao explained that skipping meals usually means ingesting a larger energy load at one time, which can aggravate the burden of glucose metabolism regulation and lead to subsequent metabolic deterioration. This can also explain the association between a shorter meal interval and mortality, as a shorter time between meals would result in a larger energy load in the given period.

Dr. Bao commented, “Our research contributes much-needed evidence about the association between eating behaviors and mortality in the context of meal timing and duration of the daily prandial period.”

Meal frequency, skipping, and intervals were not addressed by the 2020-2025 *Dietary Guidelines for Americans* because the Dietary Guidelines Advisory Committee “was unable to find sufficient evidence on which to summarize the evidence between frequency of eating and health.” Previous dietary studies and *Dietary Guidelines for Americans* have focused mainly on dietary components and food combinations.

Notes for editors

The article is “Meal Skipping and Shorter Meal Intervals Are Associated with Increased Risk of All-Cause and Cardiovascular Disease Mortality among US Adults,” by Yangbo Sun, MD, PhD; Shuang Rong, PhD; Buyun Liu, MD, PhD; Yang Du, MS; Yuxiao Wu, MS; Liangkai Chen, PhD; Qian Xiao, PhD; Linda Snetselaar, PhD; Robert Wallace, MD; and Wei Bao, MD, PhD (<https://doi.org/10.1016/j.jand.2022.08.119>). The article appears online in the *Journal of the Academy of Nutrition and Dietetics*, published by [Elsevier](#).

Full text of the article is available to credentialed journalists upon request. Contact Eileen Leahy at +1 732 238 3628 or andjrnmedia@elsevier.com to obtain copies. Journalists who wish to interview the study authors should contact Yangbo Sun, MD, PhD, at ysun80@uthsc.edu.

An accompanying podcast and information specifically for journalists are located at www.jandonline.org/content/media. Excerpts from the podcast may be reproduced by the media; contact Eileen Leahy to obtain permission.

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