

With Higher Body Fat Evening Chronotype Links later Eating

A recent cross-sectional study published found that healthy women with an evening [chronotype](#) (ET) consumed a greater proportion of their daily energy later in the day and had higher body fat, less favorable fat distribution, and poorer metabolic health than women with morning or intermediate chronotypes.



Study

Humans may be classified by their chronotypes as morning or evening types. The chronotype reflects individual preferences for the timing of their sleep and wake periods within the 24-hour day, relative to the [light-dark cycle](#). It influences multiple diurnal activity preferences as well as physiological functions and behaviors, including eating.

Morning chronotypes typically sleep and wake several hours earlier than ETs. Prior studies have shown that total energy and macronutrient intake, and the distribution of this intake over the day, also differ with the chronotype. They also show that ETs tend to consume less healthy food and have unhealthy eating patterns and habits. They are also more likely to gain weight and have a higher [body mass index](#) (BMI).

It is known that the circadian cycle affects food-related metabolism, including appetite, eating, digestion, metabolism of nutrients, and the [hormonal regulation](#) of these processes. As a result, the processing of macronutrients and the change in energy expenditure show substantial variation over the 24-hour day with its light-dark cycle.

Thus, the time when food is consumed as well as the changes in the pattern of intake (energy and macronutrient consumption) over the course of the day influence energy expenditure, and may differentially affect [body fat deposition](#) and metabolic processes depending on the chronotype.

Despite the suggestion that ET is related to a higher risk of obesity and metabolic disorders, little is known about how chronotype is associated with dietary intake, meal timing, body fat deposition, and [metabolic health](#) in healthy European and Pacific New Zealand (NZ) women.

Researchers conducted an exploratory secondary analysis of [cross-sectional data](#) from the PROMISE study, involving 287 healthy, non-pregnant European and Pacific New Zealand women aged 18–45 years.

Participants were classified as morning, intermediate, or evening chronotypes based on their sleep-wake preferences. Because relatively few women were morning chronotypes, the researchers combined the morning and intermediate groups for most analyses and compared them with the evening chronotype group. They then assessed dietary intake, body composition, metabolic biomarkers from fasting [blood samples](#), and records of physical activity and sleep.

Evening Chronotypes Show Greater Overall and Abdominal Fat

Most of the participants were classified as intermediate chronotypes (54%), while 34% were evening chronotypes and 12% were morning chronotypes. Subsequent comparisons were made between evening chronotypes and the combined morning-intermediate (MT-IT) group. ET were mostly of Pacific ethnicity, compared with NZE women in the combined morning-intermediate (MT-IT) group. ET were younger, more likely to live in socioeconomically deprived areas, and had higher BMI and [anthropometric](#) measures suggestive of greater overall fat accumulation, including abdominal fat.

ET tended to wake about three hours later than the combined MT-IT group, with sleep onset being about 2.5 hours later as well. The differences in habitual bed and wake times on workdays compared to free days, also known as social jetlag, were greater for ET than for the combined MT-IT group, though both had a similar self-reported total [sleep duration](#) of about 9 hours.

The strong overlap between chronotype and ethnicity was an important feature of the study [population](#), with most evening chronotypes being Pacific women. Although the analyses adjusted for age, ethnicity, and socioeconomic deprivation, the authors noted that these factors may still have influenced the observed associations and should be considered when interpreting the findings.

Results and Conclusion

The study has several limitations. Self-reported food intake could have introduced bias due to misreporting and poor recall. No internal circadian phase marker was used, making it difficult to assess whether meal timing aligned with each participant's internal biological clock. In addition, because the study was cross-sectional, it could identify associations but could not determine whether later eating or chronotype caused differences in body composition or metabolic health. This also means the proposed mechanisms involving disrupted glucose and [lipid metabolism](#) remain hypothetical rather than directly demonstrated.

However, the findings were based on hypotheses informed by the current literature and persisted across multiple measures over the same period. The authors also noted that the observed effect sizes were relatively small, although they argued that the consistency of the findings across multiple related outcomes supports their potential [clinical relevance](#).

Only young healthy women were included, but their menstrual history was not considered, though periods may interfere with multiple eating and sensory behaviors and with [energy expenditure](#).

The morning chronotype group was relatively small, requiring the researchers to combine [morning](#) and intermediate chronotypes for most analyses. This limited their ability to determine whether intermediate chronotypes differed from true morning chronotypes.

Finally, because most evening chronotypes were Pacific women, whereas most morning and intermediate chronotypes were New Zealand Europeans, the effects of chronotype could not be fully disentangled from ethnicity, [cultural influences](#), dietary habits, and socioeconomic factors. Although the analyses adjusted for these variables, the authors cautioned that the findings should be interpreted carefully and confirmed in more ethnically balanced populations.

The findings suggest that ET not only consumed a greater proportion of their daily energy later in the day and more [carbohydrates](#) overall than the combined morning-intermediate group, but also had less favorable body composition and metabolic profiles.

In this cross-sectional study, greater evening energy and [macronutrient intake](#) was associated with higher total and abdominal body fat among ET, suggesting a potentially greater susceptibility to obesity when eating later in the light-dark cycle. However, because the study was observational and chronotype was closely linked with ethnicity and socioeconomic factors, it cannot determine whether later eating directly caused these differences.

The authors conclude that further research into chrono-nutrition is needed to clarify these relationships and determine whether aligning meal timing with [circadian biology](#) could eventually inform personalized strategies to improve metabolic health.

Source:

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