Study finds menstrual periods are arriving earlier, especially among racial minority and lower-income individuals

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The average age at menarche—the first menstrual period—has been decreasing among younger generations in the U.S., especially those

belonging to racial minorities and lower socioeconomic statuses, according to a new study led by researchers at Harvard T.H. Chan School of Public Health. It also found that the average time it takes for the menstrual cycle to become regular is increasing.

The study, published in *JAMA Network Open*, is the latest publication from the Apple Women's Health Study, a longitudinal study of menstrual cycles, gynecological conditions, and overall women's health conducted by Harvard Chan School, the National Institute of Environmental Health Sciences, and Apple.

"Our findings can lead to a better understanding of menstrual health across the lifespan and how our lived environment impacts this critical vital sign," said co-principal investigator Shruthi Mahalingaiah, assistant professor of environmental, reproductive, and women's health at Harvard Chan School.

While previous studies have shown trends towards earlier menarche over the past five decades, data has been limited on how these trends present within different racial groups and socioeconomic statuses. Additionally, few studies have had sufficient data to identify any trends regarding time to menstrual cycle regularity.

The researchers used the Apple Women's Health Study's large, diverse dataset to fill this research gap. Participants who enrolled in the study between November 2018 and March 2023—71,341 in total—self-reported the age at which they first began menstruating and their race and socioeconomic status.

The researchers divided the participants into five age brackets: born between 1950–1969, 1970–1979, 1980–1989, 1990–1999, and 2000–2005. Ages of menarche were defined as early (younger than 11 years old), very early (younger than 9), and late (ages 16 and above).

A subset of participants (61,932) self-reported the time it took for their menstrual cycle to become regular and were divided into five categories: up to two years, between three and four years, longer than five years, hasn't become regular, or became regular with use of hormones. Another subset (9,865) provided their body mass index (BMI) at their age of menarche.

The study found that as birth year increased (meaning younger participants), average age at menarche decreased and time from menarche to menstrual cycle regularity increased. Among participants born from 1950–1969, the average age at menarche was 12.5 years, and the rates of early and very early menarche were 8.6% and 0.6%, respectively.

Among participants born from 2000–2005, the average age of menarche was 11.9 years, and the rates of early and very early menarche were 15.5% and 1.4%, respectively. Across the two groups, the percentage of participants who reached menstrual cycle regularity within two years of menarche decreased from 76% to 56%.

The researchers observed that these trends were present among all sociodemographic groups but were most pronounced among the participants who identified as Black, Hispanic, Asian, or mixed race, and who rated themselves as belonging to a low socioeconomic status.

The findings showed that BMI at age of menarche could explain part of the trend toward periods starting earlier—in other words, that childhood obesity, a risk factor for early puberty and a growing epidemic in the U.S., could be a contributing factor to earlier menarche. Other possible factors that might explain the trend include dietary patterns, psychological stress and adverse childhood experiences, and environmental factors such as endocrine-disrupting chemicals and air pollution.

"Continuing to investigate early menarche and its drivers is critical," said corresponding author Zifan Wang, postdoctoral research fellow in Harvard Chan School's Department of Environmental Health.

"Early menarche is associated with higher risk of adverse health outcomes, such as cardiovascular disease and cancer. To address these health concerns—which our findings suggest may begin to impact more people, with disproportionate impact on already disadvantaged populations—we need much more investment in menstrual health research."

The authors noted some limitations to the study, including that it relies heavily on retrospective self-reporting.

More information: Menarche and time to cycle regularity among females born between 1950-2005 in the US, *JAMA Network Open* (2024). DOI: 10.1001/jamanetworkopen.2024.12854

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