

The Association Between Age at Menarche and Adult BMI in the United States

Background: The prevalence of adult obesity in the United States has increased from 30.5% to 42.4% from 1999 to 2018. Simultaneously, age at menarche has been decreasing in developed countries for the past 50 years. Early age at menarche may be a marker for subsequent obesity risk.

Objective: This paper examines the association between age at menarche and adult body mass index (BMI) in a longitudinal study of mid-life women in the United States who were observed at the beginning of the rapid increase in obesity in the US.

Methods: We used data from the Midlife in the United States (n=2666 women, average age 46.6 in 1995-96) to predict adult BMI in 1995-96, 2004-06, and 2013-14 from self-reported age at menarche using log-linear regression, controlling for demographics and childhood socioeconomic status.

Results: The median age at menarche was 13 years (range 7-21 years). We found an inverse association between age at menarche and adult BMI in 1995-96, 2004-06, and 2013-14. In 1995-96, women who experienced menarche at 7-11 years (n=503) had an average adult BMI at 26.5 kg/m² (95% CI: 25.6, 27.4). Women with age at menarche of 12 (n=722) and 13 years (n=785) had an average adult BMIs of 25.3 kg/m² (95% CI: 23.9, 26.8) and 24.2 kg/m² (95% CI: 22.8, 25.6), respectively. Women with age at menarche of 14-17 years (n=656) had an average adult BMI of 23.9 kg/m² (95% CI: 22.5, 25.3). A similar distribution was observed for adult BMI in 2004-06 and 2013-14, but the average BMI was higher. Variables significantly associated with higher adult BMI included older age group (p<0.03), non-White race (p<0.001), and lower parental educational attainment (p=0.01).

Conclusions: Women with early age at menarche (7-11 years) were more likely to be overweight in midlife compared to women who experienced menarche later. Early age at menarche may be a marker for increased BMI in midlife and associated chronic conditions.