

Title: Father Absence, BMI and Pubertal Development in the Bay Area Breast Cancer and the Environment Research Center
Category: Recent Scientific Data

Julianna Deardorff, Ph.D.¹, Bruce Ellis, Ph.D.², Lawrence Kushi, Sc.D.³, Paul Ekwaru, M.A.¹, Robert A. Hiatt, M.D., Ph.D.⁴

¹From the School of Public Health, University of California, Berkeley

²From the Department of Family Studies and Human Development, Norton School of Family and Consumer Sciences, University of Arizona

³From the Division of Research, Kaiser Permanente Northern California

⁴From the Department of Epidemiology and Biostatistics, University of California, San Francisco

Background: Early life events play an important role in the development of breast cancer.^{1,2} The link between puberty and breast cancer^{3,4} is of particular concern, given that the average age of pubertal onset among U.S. females is declining.^{5,6} Hereditary factors, physical activity levels and BMI only partially explain this secular trend. Evidence suggests that environmental and behavioral factors also influence puberty.⁷⁻¹⁰ Characteristics of the family environment, in particular father absence, have been established as determinants of pubertal timing.¹³⁻²¹ Analogous animal studies confirm the important role of family composition.²²⁻²⁴

Objective: To prospectively examine effects of father absence at age 6-8 years on girls' BMI, and pubertal status two years later.

Method: In BABCERC, we assessed biologic father absence, breast and pubic hair development, and height and weight annually. The current investigation focuses on the effect of father absence at age 6-8 years on BMI and pubertal status outcomes 2 years later. The sample is comprised of 444 ethnically diverse girls and their primary caregivers. We treated onset of puberty as a time to event outcome. We used the girl's age at the exam in which she is first determined to have had puberty onset to estimate the age at pubertal onset. A multivariable Cox proportional hazards regression model was then used to analyze the effect of father's absence on age at onset of puberty (breast /pubic hair). In analyzing the effect of father absence we controlled for household income and ethnicity and we assumed BMI to be in the casual pathway for the effect of father's absence on onset of puberty.

Preliminary Results: At baseline, about 80% of participants lived with both a biologically-related father. Crude correlations between father absence at Year 1 and Tanner Stage at Years 2 and 3 showed significant associations between Year 1 father absence and Year 2 pubic hair development ($p < .01$) and Year 3 breast ($p < .05$) and pubic hair ($p < .01$) development. Results from Cox hazards regression analyses will better illuminate effects of father absence on pubertal development, while adjusting for family income, and allow us to test the mediating role of BMI and potential moderating role of ethnicity.

Implications: By incorporating BMI, ethnicity and breast and pubic hair measures into our models, we seek to extend previous research linking father absence to menarche. The current study has potentially significant clinical implications for girls' health in the short term and breast cancer in adulthood.