

Changes in Femoral Neck Bone Mineral Density: A Comparison of NHANES 2005-2006, 2007-2008, and 2009-2010

ANTHONY BANKS, and DAVID L. NICHOLS

Exercise Physiology Laboratory; Department of Kinesiology; Texas Woman's University; Denton, TX

Category: Doctoral

ABSTRACT

Bone mass is an important component of quality of life and can be influenced by lifestyle factors, such as physical activity and diet. However the US surgeon general found a growing portion of Americans are not engaging in adequate amounts of physical activity and/or consuming less calcium and vitamin D. The purpose of this study was to compare bone mineral density (BMD) of American adults of different ethnicities and time periods to detect any differences. It was hypothesized that BMD would be lower in participants from more recent years. Measurements were taken at the femoral neck of volunteers between 18 and 35 years of age (n = 3578) from 2005-2006 (n = 1160), 2007-2008, (n = 1135), and 2009-2010 (n = 1283) by the National Center for Health Statistics. The data was analyzed using a three-way independent ANOVA with an alpha level of .05. Femoral neck BMD was used as the dependent variable; and year, age, and race were independent variables. Results did not find a significant difference in BMD based on year (p = .172), however there were significant differences based on age and ethnicity (p < .001). African-American men (p < .001) and women (p < .001) had a higher BMD than any other ethnicity. Moreover, Hispanic men had a higher BMD (p < .001) than Caucasian men. In men, BMD significantly decreased in each age group (p < .001); whereas in women a significant decrease was detected in every other age group (p < .05). In addition, in contradiction to literature, the results found peak BMD to occur between 18 and 19 years of age as opposed to mid-to-late twenties. Despite not finding a significant difference in BMD based on year, this study confirms African American men and women have higher a BMD than any other ethnicity.

Mean bone mineral density (g/cm ²) in men			
	Race		
Age	Caucasian	African American	Hispanic
18-19	.996	1.087	.998
20-25	.963	1.059	.976
26-30	.905	1.025	.977
31-35	.893	.972	.947

Mean bone mineral density (g/cm ²) in women			
	Race		
Age	Caucasian	African American	Hispanic
18-19	.891	.987	.894
20-25	.881	.969	.877
26-30	.868	.966	.868
31-35	.860	.903	.877