Athletes who compete in non-weight-bearing activities such as swimming and cycling are at risk of developing low bone mineral density (BMD). Athletes in long distance running are at risk of low BMD.

**PURPOSE:** To elucidate the relationship between bone mineral density (BMD) and BC measurements between a college aged non-student athlete (NA) population and a student-athlete (ATH) population.

**METHODS:** Bone mineral density (BMD) and BC measurements from NA population (n = 61) and from ATH population (n = 39) were collected using the Dual Energy X-ray Absorptiometry (DEXA). Furthermore, sex specific differences between and within the subgroups were evaluated. The variables compared between groups for the two-sample t-tests included BMD, weight (WT), fat mass (FM), lean mass (LM), and bone mineral content (BMC). Statistical analysis was performed using Minitab 18 software.

**RESULTS:** No statistical difference was found for BMD, WT, LM, and BMC between subgroups. However, sex-specific differences were present for all variables of interest (BMD Females: 1.170 ± 0.07 g/cm² vs Males: 1.277±0.105 g/cm²; WT Females: 33.2±20.3 lbs vs Males: 169±143.7 lbs; FM Females: 36.1±13.5 lbs vs Males: 169±143.7 lbs; LM Females: 135.0±18.0 lbs; BMC Females: 5.61±0.87 lbs vs Males: 7.31±1.07 lbs). Pearson’s correlation coefficient results indicate that there was a moderate to strong relationship between BMD and lean mass for all groups.

**CONCLUSIONS:** Activity may play a role in the relationship between BMD and BC. The results of this study can help direct future studies on bone health and BC. Data from this study could be utilized in the formation of a predictive model for the development and interactions of osteoporosis and obesity. Such a model would help in the identification of risk factors early in life so appropriate intervention can be put in place. Quantitative bone health and BC data can help coaches and medical professionals prescribe appropriate training and medical interventions if necessary for subjects who are at risk for developing bone or metabolic diseases. Small sample size and lack of activity data were limitations of this current study.