

Effect of Body Composition, Diet and Lifestyle Factors on Bone Mineral Content of Young Adults

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OBJECTIVES: To determine bone mineral status of young Pakistani adults and its relation with socioeconomic factors, dietary intake, physical activity and 25-hydroxyvitamin D (25OHD).

METHODS: Socio-demographic factors of healthy medical students were assessed; validated food frequency and physical activity questionnaires were filled. Quantitative heel ultrasound was done using Osteosys Sonost-3000. Total 25OHD was measured on ADVIA-Centaur; Siemens. Multiple regression analysis was performed and the model was adjusted for age and sex whereas T-score, Z-score, bone quality index (BQI) and speed of sound (SOS) was studied as independent variables.

RESULTS: Mean age was 20.03±0.99 years (n=97), 58.4% being females. Mean BMI was 22.16±3.45 kg/m² and 13.9% of the subjects were underweight, 47.5% normal, 19.8% overweight and 18.8% obese. Daily mean energy, protein and fat intake of females were lower than males (p value <0.001). Daily mean calcium intake was 862.8±457.8 mg/day and was also significantly lower in females (p value <0.001). In 64.3% subjects average calcium intake was below *Recommended Dietary Allowance (RDA)* (1000 mg/day for 19-50 years). Inactivity was more amongst females than males (20.3% versus 16.7%), with 18.9% of the students being inactive. Mean 25OHD levels were 15.02±8.63 ng/ml, 86% of the group being Vitamin D deficient. No significant association was found between z-scores and 25OHD levels. Out of the total students, 20.6% had z-scores 2SD below the age and gender matched mean bone mineral density. The males had significantly higher BQI and SOS than females (p-value <0.001). BQI and SOS both correlated positively with weight, height, waist circumference (p-value <0.001). Mean calcium and protein intake were lower in subjects with low z scores (p-value 0.07 and 0.02 respectively). Regression revealed students living in apartments/small houses were significantly associated with z-scores, SOS and BQI.

CONCLUSION: A significant number of students had low z-scores, low calcium intake and physical inactivity. Only housing seems to affect z-score of otherwise healthy Pakistani adolescents. Confirmation of our findings with DXA and further research on a larger group is needed to clarify the bone health status of adolescents living in this part of the world where there is high prevalence of Vitamin D deficiency.

Key words: Housing; Vitamin D; Lifestyle; Diet

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