**Background:** It has been established that Vitamin D plays an active role in calcium homeostasis by regulating intestinal calcium and phosphorus absorption, renal calcium reabsorption and bone mineralization. Vitamin D deficiency has also been related to type 2 diabetes and metabolic syndrome.

**Purpose:** Given that we have previously observed a very high rate of severe Vitamin D deficiency in Qatari girls the aim of this study was to examine whether Vitamin D deficiency was carried on into adulthood in a Qatari population and examine the effect upon bone mineral density and metabolic health status.

**Methodology:** In this cross sectional study, we evaluated the serum 25 hydroxy-Vitamin D (25(OH)D) levels of 171 male and female Qatari adults (37.2 ± 10 years, body fat 44.1 ± 8.8 %, BMI 31.9 ± 7.9 kg/m²), bone mineral density (BMD) and body composition assessment with dual energy X-ray absorptiometry (DEXA). In addition, subjects were assessed for aerobic fitness. Haematological investigations included fasting, glucose, insulin, and lipid profile analysis.

**Results:** Despite high level of body fatness and low aerobic fitness (Predicted VO\textsubscript{2}max 25.2 ± 7.2 ml/kg/min), blood pressure, glucose, insulin and lipid markers were all within acceptable ranges. Vitamin D deficiency was seen in this group with mean serum 25(OH)D being 15.8 ± 10.3 ng/ml, while PTH was just within the normal range (63.4 ± 23.8 pg/ml). Mean total body BMD was within the acceptable limits (1.2 ± 0.1 g/cm³). There was no correlation between 25(OH)D and BMD, however, BMD was strongly associated with total body weight (r=0.540, p<0.05) and BMI (r=0.456, p<0.05). Furthermore, there were no significant correlations between 25(OH)D and markers of type 2 diabetes, dyslipidaemia, or fitness.

**Conclusion:** The results suggest despite high levels of body fatness, low aerobic fitness and Vitamin D deficiency that this cohort were relatively healthy. On first impression, body weight appears to be a protective mechanism in maintaining BMD within this population. However, those individuals with a BMI < 25 kg/m² had normal BMD despite extremely low serum 25(OH)D levels (12.6 ± 7.6 ng/ml). This suggests that further research is warranted to elucidate possible contributing factors resulting in a normal BMD despite minimal sun exposure.