Vitamin D deficiency and obesity are both prevalent conditions in the northern countries, especially among immigrants. The aims were to assess the possible relationship between body fat and vitamin D status, and to investigate the effect of body fat on the response to oral vitamin D supplementation in Pakistani immigrants in Denmark. Data were obtained from a 1-year double-blind randomised controlled trial with oral vitamin D supplementation. A total of 122 women and men received either vitamin D3 supplementation (10 or 20μg/day) or placebo. No association was found between body fat percentage and vitamin D status in a multiple linear regression model (P<0.001). No effect of body fat was seen on the vitamin D status response following the intervention with vitamin D. In conclusion, there was no baseline association between body fat percentage and vitamin D status, and body fat percentage had no effect on the response to vitamin D supplementation.