

Dietary calcium intake and fat mass in Spanish young adults: The role of muscle strength

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Abstract

Obesity is declared as a chronic multifaceted health problem, and young adults may be particularly vulnerable to weight gain. This study aims to identify the role of dietary calcium intake and the muscle strength index in handling excess of fat mass in young adults and to examine if the relationship between dietary calcium intake and fat mass percentage is mediated by muscle strength. A cross-sectional study including 355 Spanish college students (aged 21.05 ± 3.11) was performed during the 2017–2018 academic year. Pearson correlation coefficients were estimated to determine the relationship between dietary calcium intake, fat mass percentage, body mass index, muscle strength components, and total energy intake. ANCOVA models were used to analyze the differences in the muscle strength index by total dietary calcium intake categories, as well as the differences in % fat mass by total dietary calcium intake and muscle strength index categories, controlling for different sets of confounders. A mediator analysis was conducted to test if the relationship between dietary calcium intake and fat mass percentage was explained by muscle strength. Data on the fat mass percentage, dietary calcium intake, and muscle strength index as the sum of the standardized z-score of the standing long jump and z-score of handgrip/weight were collected. The muscle strength index was significantly better in young adults with higher dietary calcium intake. Moreover, the fat mass percentage was significantly lower in those with a higher dietary calcium intake and a better muscle strength index. Finally, the relationship between dietary calcium intake and fat mass percentage was fully mediated by muscle strength ($z = -1.90$; $p < 0.05$), explaining 33.33% of this relationship. This study suggests that both a major dietary calcium intake and muscle strength are associated with fat mass percentage. Moreover, muscle strength mediates the link between dietary calcium intake and fat mass percentage. Therefore, both high dietary calcium intake and exercise activities aimed at improving muscle strength levels may help to prevent the cardiometabolic risk associated with an excess of fat mass in young people. © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

Author keywords

Adiposity; Adults; Calcium; College student; Fat mass; Mediation; Muscular fitness; Spain