

Lean mass as a total mediator of the influence of muscular fitness on bone health in schoolchildren: a mediation analysis

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Abstract: This report aims to analyse the independent association of lean mass and muscle fitness with bone mineral content (BMC) and bone mineral density (BMD), and to examine whether the relationship between muscle fitness and bone health is mediated by lean mass. Body composition (by dual energy X-ray absorptiometry (DXA)), muscle fitness, physical activity, age and height were measured in 132 schoolchildren (62 boys, aged 8-11 years). Analysis of covariance tested differences in bone-related variables by lean mass and muscle fitness, controlling for different sets of confounders. Linear regression models fitted for mediation analyses examined whether the association between muscle fitness and bone mass was mediated by lean mass. Children with good performance in handgrip and standing long jump had better and worse bone health, respectively. These differences disappeared after controlling for lean mass. Children with high lean mass had higher values in all bone-related variables. In addition, the relationship between muscle fitness and bone mass was fully mediated by lean mass. In conclusion, the relationship between upper-limbs muscle fitness and bone health seems to be dependent on lean mass but not on muscle fitness. Schoolchildren with high lean mass have more BMC and BMD in all regions. Lean mass mediates the association between muscle fitness and bone mass. © 2014, © 2014 Taylor & Francis.

body composition

bone mineral content

bone mineral density

children

muscular strength

arm

body composition

body mass

bone density

child

controlled study

cross-sectional study

exercise test

human

leg

male

muscle strength

photon absorptiometry

physiology

procedures

randomized controlled trial

skeletal muscle

Absorptiometry, Photon

Body Composition

Body Mass Index

Bone Density

Child

Cross-Sectional Studies

Exercise Test

Humans

Lower Extremity

Male

Muscle Strength

Muscle, Skeletal

Upper Extremity