

The Effects of Physical Activity on Bone Architecture in Adulthood: A Systematic Review of Peripheral Quantitative Computed Tomography Studies

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Introduction

to determine the effects of physical activity (PA) on bone architecture measured by peripheral quantitative computed tomography (pQCT) in healthy adults

Methods



Protocol:

the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting guidelines

Study selection:

Observational and interventional studies
The effects of PA on bone outcomes measured by pQCT
Healthy adults aged 18 and older



Assessment of methodological quality:

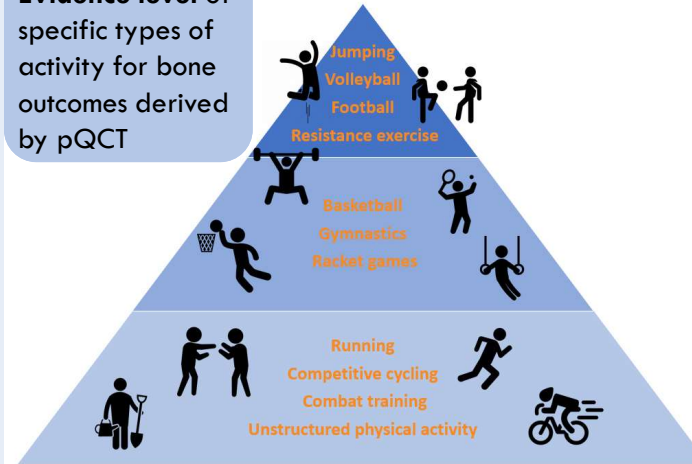
Newcastle-Ottawa Scale (NOS) was used in the quality assessment of all included studies

Results

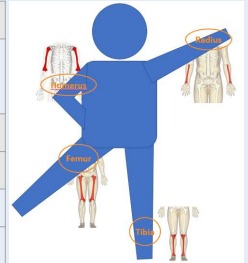
24 articles: **5** randomized controlled trials
15 cross-sectional studies
4 longitudinal observation studies

Participation in bone-specific PA, especially **high-intensity exercises** (such as combat training and soccer), was positively associated with the trabecular thickness and trabecular number in adults

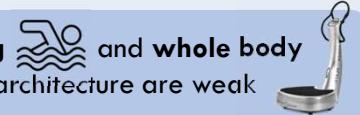
Evidence level of specific types of activity for bone outcomes derived by pQCT



Bone outcomes derived by pQCT		
	Skeletal sites	Numbers of paper
Upper limb	Radius	8
	Humerus	2
Lower limb	Tibias	20
	Femurs	2



The correlations of **Swimming** and **whole body vibration training** with bone architecture are weak



Participants engaging in high-impact PA (such as running, jumping, and ball games) showed **8 -15% higher cortical thickness** at the tibia for both young and elderly adults compared with inactive peers in both females and males

Running (middle- or long-distance running) and **nonspecific resistance exercise** have more effects on bone architecture for females

Conclusions

Participation in **high-intensity PA** is positively related to bone architecture outcomes in adults.

There was large heterogeneity in the studies identified indicating that potential covariates, such as body composition, sex, and age, might affect the impacts of PA on bone microarchitecture outcomes in adults.



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