Publication

# The Obesity Factor: How Cardiorespiratory Fitness is Estimated More Accurately in People with Obesity

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**Author(s)** Königstein, Karsten; Klenk, Christopher; Rossmeissl, Anja; Baumann, Sandra; Infanger, Denis; Hafner, Benjamin; Hinrichs, Timo; Hanssen, Henner; Schmidt-Trucksäss, Arno
**Author(s) at UniBasel** Hinrichs, Timo ; Königstein, Karsten ; Klenk, Christopher ; Rossmeissl, Anja ; Baumann, Sandra ; Infanger, Denis ; Hafner, Benjamin ; Hanssen, Henner ; Schmidt-Trucksäss, Arno ;
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Cardiopulmonary exercise testing is clinically used to estimate cardiorespiratory fitness (CRF). The relation to total body mass (TBM) leads to an underestimation of CRF in people with obesity and to inappropriate prognostic and therapeutic decisions. This study aimed to determine body composition-derived bias in the estimation of CRF in people with obesity.; Two hundred eleven participants (58.8% women; mean BMI 35.7/m; 2; [ś 6.94; 20.7-58.6]) were clinically examined, and body composition (InBody720; InBody Co., Ltd., Seoul, South Korea) and spiroergometrical peak oxygen consumption (VO; 2; peak) were assessed. The impacts of TBM, lean body mass (LBM), and skeletal muscle mass (SMM) on CRF estimates were analyzed by the application of respective weight models. Linear regression and plotting of residuals against BMI were performed on the whole study population and two subgroups (BMI < 30 kg/m; 2; and BMI ≥ 30 kg/m; 2; ).; For every weight model, ∆mean VO; 2; peak (expected -) was positive. LBM and SMM had a considerable impact on VO; 2; peak demand (P = 0.001; ∆R; 2; = 2.3%; adjusted R; 2; = 56% and P = 0.001; ∆R; 2; = 2.7%; adjusted R; 2; = 56%), whereas TBM did not. Confounding of body composition on VO; 2; peak did not differ in LBM and SMM.; TBM-adjusted overestimation of relative VO; 2; demand is much higher in people with obesity than in those without. LBM or SMM adjustment may be superior alternatives, although small residual body composition-derived bias remains.
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