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Response Letter

Reply on “Significant change for body composition data”

To the editor

The comments about our research article are humbly acknowledged and well received [1]. Although, dual-energy X-ray absorptiometry (DXA) generally displays good precision for assessing body composition with coefficient of variation (CV) between 2 and 3% for total body fat, and 1% for bone mineral content [2]. For body composition analysis using DXA, the hydration of fat-free mass tissue should remain constant at 73%, but can vary from 67% and 85% [2]. If a participant contains more than the average amount, DXA can overestimate the fat-free mass content [2]. One important limitation is that our study did not control participants' hydration status. One might be interested in the reliability of body composition measures taken on the same participant over different days. However, a previous study displayed that preformed water intake is lower in 70–79 older men and women than in 40–49 age groups [3]. Possibly indicating that our participants would not show hydration status higher than 73%. Nevertheless, the reliability of body composition measurement is of great importance.

The basic calculations of reliability, such as controlling the technical error (TE), or the aggregate of factors that collectively affect the true value of measurement, can give us a piece of important information called the smallest real difference or minimal clinically important difference [4,5]. However, this statistical measurement should be interpreted in conjunction with patient-reported outcomes, common laboratory tests (eg, uric acid) [6], and specialized laboratory tests (eg, follistatin, myostatin, and IL-6 levels) [6] beyond primary endpoints (eg, body composition) [5].

The question ‘Does the reduction in percent body fat of 3% represents a statistically significant difference, a real difference, relevant from a clinical perspective or a measurement error?’ is difficult to answer. For the clinical treatment of obesity, weight losses of 5%–15% are clinically significant (eg, diabetes remission, and HDL-cholesterol) and have positive effects on depression, joint pain, and sexual function. In our study, octogenarians with favorable body fat displayed greater functional performance [7]. However, greater functional performance does not translate to a minimal clinical important difference (MCID) between groups.

We agree that a “significant change” in body composition values is difficult to interpret. However, statistical significance testing (represented by P-value) is routinely misunderstood [8], leading to challenges in interpretation. Assuming that the P-value is not an exclusive indicator of an association or the existence of an effect, researchers should be encouraged to report other complementary statistical tools alongside the P-value (eg, second-generation P-values, effect size, confidence intervals, MCID, and magnitude-based inference) to improve scientific data interpretation and provide a more efficient and comprehensive analysis [5,9,10].

We are eager to further progress in this osteoporosis and sarcopenia field. We hope our article and these comments will stimulate future research, helping us all better understand how to classify a significant change on muscle mass and body fat measurements. However, to get a well understanding of MCID, calculations of reliability should also be considered for DXA measurements.

Conflicts of interest

The authors declare no competing interests.

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