TACSM Abstract

Analyzing the Between-Day Reliability of Three-Dimensional Body Scanners for Body Composition Assessment

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ABSTRACT

In the growing world of health and well-being, three-dimensional (3D) scanning is emerging as a popular tool to assess body composition. While body composition cannot be truly "measured" in living humans, it can be approximated. This, however, leads to two types of errors (i.e., technical and biological) in the body composition assessment. **PURPOSE**: This study was used to determine what percent or range of percentages in body fat one must exceed before concluding a real change has occurred. By conducting assessments on separate days, with only a short period of time between them, true changes in body composition are unlikely to occur. Therefore, this design can help determine the inherent, between-day error in a body fat assessment to provide context for longer-term changes. **METHODS:** In the present investigation, thirteen participants were scanned using three distinct 3D body scanners (Fit3D Proscanner, Sizestream SS20, and Styku S100) on two separate mornings, separated by 24 to 48 hours. Each subject had to follow the pre-assessment restrictions and ensure they fit all the eligibility requirements for this study. Then, all body fat percentage (BF%) values from the 3D scanners were recorded and analyzed to determine the between-day reliability. **RESULTS:** Intraclass correlation coefficients ranged from 0.971 to 0.997 for the three scanners. The least significant change (LSC) values were 1.2%, 2.6%, and 3.0% for the Styku S100, Fit3D Proscanner, and Sizestream SS20, respectively. When examining differences in BF% for individual participants, the between-day differences ranged from -1.1% to 1.0% for Styku S100, -1.9% to 3.2% for Fit3D Proscanner, and -4.0% to 3.0% for SizeStream SS20. **CONCLUSION:** These results collectively suggest that the Styku S100 has the highest between-day reliability and lowest technical error of the three scanning systems. Overall, however, it is important for consumers to understand that each 3D scanner contains some level of error that should be considered when interpreting the results of an assessment. This study can not only be applied to future research determining the most reliable body composition assessments, but it can also aid individuals in understanding how large of a change in body fat is needed to exceed the error of a 3D scanner and therefore be considered a "real" change.