

ESTIMATING PERCENT BODY FAT IN DISABLED INDIVIDUALS WITH SPINAL CORD INJURY: A PILOT STUDY

Becky Garner, Dr. Judy R. Wilson, Dr. Abu Yilla, Dr. Mark Ricard, Brad Heddins, Dr. Barry McKeown

Department of Kinesiology, University of Texas Arlington, Arlington, TX

ABSTRACT

Accurate and simple to administer field methods that currently exist tend to underestimate values when used to determine percent body fat (%BF) in individuals with spinal cord injury (SCI). This group of people is more prone to obesity and cardiovascular disease (CVD) as well as other secondary conditions. The purpose of this study was to evaluate the accuracy of three methods of measuring body composition as compared to total body dual-energy x-ray absorptiometry (DEXA) scan. These three methods included air displacement plethysmography (Bod Pod), hydrostatic weighing (HW) and seven site skinfold (SKF) measurement as recommended by the American College of Sports Medicine (ACSM). Ten male college students, in the Department of Kinesiology and/or members of the collegiate wheelchair basketball team, participated in the study. Five of the participants were disabled athletes with SCI and five participants were physically active, non-disabled students who served as controls. Of the ten participants, six completed all four of the body composition measures. Both forced vital capacity (FVC), via a flow volume test, and residual volume (RV), via nitrogen washout, were obtained for use in estimating %BF as determined by underwater weighing. The %BF values obtained from the HW using the Siri and Brozek equations had the highest correlation to the DEXA ($r=.916$). The results of the %BF as measured by the Bod Pod also showed a high correlation ($r=.867$). Although the SKF method showed a high correlation with the DEXA, ($r=.798$), it is evident that, with more participants, this method would severely under-predict %BF in the disabled group. In addition, the predicted DEXA from HW_{SM} had a significant relationship ($DEXA = 1.342 * HW_{SM} - 4.795$, $R^2 = .938$, $SEE = 3.108$). These findings suggest that HW and Bod Pod are accurate methods of estimating %BF in both disabled and non-disabled individuals as compared to DEXA.

Key Words: FIELD METHOD, OBESITY, CARDIOVASCULAR DISEASE, SPINAL CORD INJURY, DISABLED.