

THE VALIDITY OF A COMMONLY USED BODY COMPOSITION EQUATION RELATIVE TO DUAL-X-RAY ABSORPTIOMETRY IN GAELIC GAMES PLAYERS

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Introduction

Current field methods for assessing body composition utilize skinfold thicknesses and generic/specific population specific equations to estimate body fat percentage (BF %). The equation of Durnin and Womersley (1974) (D&W-SKf₄) has been extensively used in assessing BF% in Gaelic games players. The present study determined body composition in sub-elite Gaelic games players with Dual X-ray absorptiometry (DXA) and compared estimates of BF% derived from the equation D&W-SKf₄ (1974) to DXA.

Methods

Thirty-five Caucasian Gaelic games players (age: 21 ± 1.7 yrs; stature: 179.6 ± 5.7 cm; body mass: 78.1 ± 8.6 kg) underwent whole body fan beam measurement of BF% by DXA (Hologic QDR, USA). Skin fold thicknesses were determined at four sites (bicep, tricep, sub-scapular, supra-spinal) using Harpenden skinfold callipers. Body density was calculated according to the formula of D&W-SKf₄ (1974) with BF% derived using Siri's (1956) equation. Differences between variables were determined via a paired t-test. Agreement between DXA and D&W-SKf₄ was assessed via 95% limits of agreement (LOA)².

Results & Discussion

Estimates of D&W-SKf₄-BF% ($16.7 \pm 3.4\%$) did not differ from DXA-BF% ($16.6 \pm 4.1\%$) ($t_{34} = -0.143$, $P = 0.887$). Estimates are consistent with literature (11.5-18%) reflecting the status of the players. No systematic bias was apparent between DEXA and D&W-SKf₄ ($-0.067 \pm 2.76\%$; 95% CI [-1.01 and 0.88]). The correlation between the average BF% and the mean difference was not significant ($r = -0.26$, $P = 0.128$).

D&W-SKf₄ under/over estimated BF% compared to DXA in 46% and 64% of cases respectively. The upper and lower LOA [+5.4% and -5.5%] relative to DXA represents error rate approximate to other doubly-indirect body composition methods.

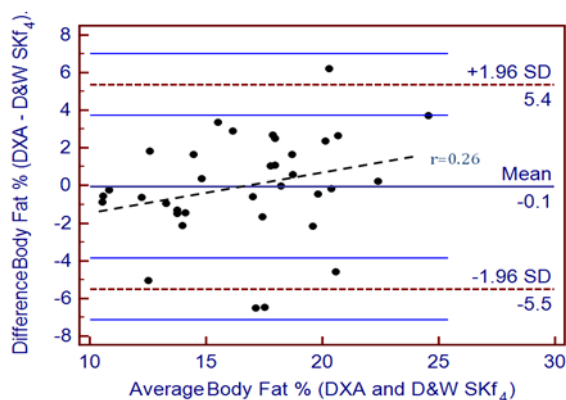


Figure 1. 95% Limits of Agreement Plots between DXA and Durnin and Womersley (1974).

Conclusion

The use of D&W-SKf₄ (1974) equation¹ in this population may not provide an acceptable %BF estimates based on the observed LOA range. Further work should compare the utility of other equations in this population particularly those that implement skinfold measures derived from lower body measurement sites.

References

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