

## Evaluation of Body Fat Percentage with Vertical and Longitudinal Skinfolts

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### ABSTRACT

Subcutaneous fat content, as well as body fat percentage (BF%), can be effectively assessed using skinfold calipers. While skinfolts (SFs) are practical and easy to attain, their accuracy could be reduced if the SFs are not collected with the ideal fold orientation. **PURPOSE:** To determine if vertical or longitudinal SFs in the trunk area are better predictors of BF%. **METHODS:** A pool of thirty-eight male ( $21.29 \pm 4.59$  yrs,  $15.68 \pm 4.82$  BF%) and twenty-two female ( $21.14 \pm 4.05$  yrs,  $26.63 \pm 5.34$  BF%) participants completed the study. A dual-energy X-ray absorptiometry scan was utilized to assess BF%. Using a Lange caliper, one technician assessed all SFs within the trunk in triplicate using both a vertical pinch and a longitudinal pinch. SFs sites included: 2 cm left, right, superior, and inferior of the umbilicus; left and right anterior mid-axillary line at the level of the navel; 2 cm left and right of the vertebral column at the level of the navel; midsternal line at the slimmest part of the waist and at the level of the xiphoid process. In addition, two commonly assessed diagonal folds (right suprailiac and subscapular) were collected. The relationship between SFs orientation and BF% was assessed utilizing a Pearson correlation. Stepwise linear regression was utilized to predict BF%. Data are presented as mean  $\pm$  SD. **RESULTS:** Overall, vertical folds for both males and females had a higher correlation with BF% than longitudinal folds. The right vertical mid-axillary (RVMA) SFs had a significant correlation with BF% for both male ( $r = 0.864$ ,  $p < 0.001$ ) and female ( $r = 0.712$ ,  $p < 0.001$ ) participants. Similarly, the subscapular (SS) SFs had a significant correlation with BF% for both male ( $r = 0.851$ ,  $p < 0.001$ ) and female ( $r = 0.788$ ,  $p < 0.001$ ) participants. BF% was successfully predicted [ $4.142 + (10.154 * \text{Sex}) + (0.255 * \text{RVMA}) + (0.516 * \text{SS})$ , adjusted  $R^2 = 0.874$ ], where sex (0 = male, 1 = female). The average RVMA SFs were  $18.43 \pm 7.85$  mm for males and  $19.91 \pm 6.78$  mm for females, while the SS SFs were  $13.50 \pm 4.95$  mm for males and  $14.05 \pm 5.34$  mm for females. **CONCLUSION:** Although RVMA SFs are not commonly utilized to estimate BF%, there is evidence of a high correlation with BF%. The applicability of utilizing the RVMA jointly with the SS SFs as a fast yet reliable method to estimate BF% should be examined in a large and diverse cohort.