

## **Comparison of skin fold thickness, waist circumference, waist hip ratio and BMI in predicting body fat percentage**

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### **Introduction**

Non communicable diseases have reached epidemic proportions all over the world. Body fat percentage (BFP) is a risk factor for many non communicable diseases including diabetes, hypertension and cardiovascular disease. Bio impedance analysis (BIA) provides an accurate way of measuring BFP but it is associated with a high initial cost. If anthropometric indices are found to be predictive of BFP, they can be used for clinical decision making with less cost.

### **Objectives**

To compare skin fold thickness (SFT), waist circumference (WC), waist hip ratio (WHR) and BMI in predicting BFP in adults.

### **Methods**

A sample of 1007 young adult diabetic patients (age 20- 45 years) were randomly selected and their anthropometric measurements were obtained. BFP was measured using single frequency BIA. The association between anthropometric measurements and BFP was determined using the Pearson test and linear regression analysis.

### **Results**

Of the 1007 patients, 42.3% were males. Mean age was 36.6 ( $\pm$ 11.17) years. The majority were moderately physically active (68.3%). The mean body fat percentage was 28.6% (males 21.3%, females 33.8%,  $p < 0.001$ ). The mean SFT (triceps), WC, WHR and BMI of males and females were 10.5 mm, 88.2 cm, 0.92, 24.2  $\text{kgm}^{-2}$  and 19.3 mm, 86.6 cm, 0.91, 24.9  $\text{kgm}^{-2}$  respectively. All SFT measurements ( $p < 0.001$ ) and other anthropometric measurements ( $p < 0.01$ ) except WHR, showed a significant difference between males and females. BFP showed significant correlation with BMI ( $r = 0.4$ ,  $p < 0.01$ ) and SFT at triceps ( $r = 0.67$ ,  $p < 0.01$ ) but not with WC ( $r = 0.226$ ) and WHR ( $r = 0.121$ ). SFT in the triceps ( $r = 0.67$ ,  $p < 0.01$ ) and biceps ( $r = 0.61$ ,  $p < 0.01$ ) regions showed the strongest correlation followed by SFT in the suprailiac ( $r = 0.42$ ,  $p < 0.01$ ) and subscapular ( $r = 0.4$ ,  $p < 0.01$ ) regions.

### **Conclusions**

SFT is a better indicator of BFP than BMI, WC and WHR. SFT should be considered as an important and useful anthropometric measurement when trying to gauge the body fat percentage of patients. SFT in the triceps and biceps regions is superior to subscapular and suprailiac regions in predicting BFP. If only a single SFT measurement can be taken due to time constraints, triceps SFT seems to be the measurement of choice as it shows the highest correlation with BFP.

*A poster presentation on this topic has been presented at the 125<sup>th</sup> annual sessions of the SLMA.*