TACSM Abstract

Prediction of Total Body and Regional Strength Using Dexa Body Composition Measurements

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ABSTRACT

Resistance training is a valuable exercise modality but few tools exist to aid practitioners in refining resistance exercise prescriptions. PURPOSE: To determine if a relationship exists between strength and selected body composition variables measured by DEXA; and if so, develop equations which predict total body and regional strength. METHODS: Sixty-eight subjects (Male n = 34, Age = 35±11.96yrs, Height = 181.54±6.76cm, Weight = 97.82±16.68kg, Body Fat = 31.24±8.12% | Female n = 34, Age = 37±12.6yrs, Height = 165.41±5.64cm, Weight = 80.55±18.48kg, Body Fat = 43.00±10.16%) underwent DEXA body composition testing and maximal strength testing utilizing Keiser® pneumatic resistance exercise equipment. Regional strength was assessed on seven different lifts: leg press, chest press, leg curl, lat pull-down, leg extension, triceps push-down, and biceps curl. The sum of the seven lifts was considered a measure of total body strength (TBS). Multiple linear regression (step-wise removal) was used to predict TBS and regional strength from: age, height (cm), weight (kg), lean mass (kg), fat mass (kg), and percent body fat. RESULTS:

	Height (cm)	Weight (kg)	Lean Mass (kg)	Body Fat (%)	Constant	Correlation Coefficient	SEE
Total Strength	-15.049		49.552		1657.592	R^2 = .747	293.776
Leg Press	-10.889	2.210	22.049		1291.683	R^2 = .689	151.146
Chest Press	-1.116	-0.658	4.974		101.797	R^2 = .746	25.750
Leg Curl			3.583		-17.974	R^2 = .678	30.461
Lat Pull-down	-0.494	-0.796	4.917		48.997	R^2 = .780	24.811
Leg Extension		-0.684	4.261		-17.836	R^2 = .662	31.388
Tri Push-down	-2.968		7.385	-2.706	495.841	R^2 = .564	73.997
Biceps Curl	0.291		1.233	-0.433	-51.421	R^2 = .739	11.981

CONCLUSION: DEXA body composition measurements are correlated with, and are shown to be significant predictors of total body and regional strength. Data obtained from DEXA body composition measurements are a useful tool which may aid practitioners and the general public when maximal strength testing is ill-advised or impractical.