3360 Board #48 June 1 8:00 AM - 9:30 AM

Influence of Circumference Measurements and Body Composition on Estimating Resting Metabolic Rate in Healthy Adults

Kristi Chase, Kyle Patek, John Walker, FACSM, Joni Mettler. *Texas State University, San Marcos, TX.*
Email: klc280@txstate.edu

(No relevant relationships reported)

Measurement of resting metabolic rate (RMR) is an important factor for weight management. Previous research has reported several variables to estimate RMR such as body size, percent fat (%BF), age, and sex; however, little is known regarding the effect of circumference measures in estimating RMR. **PURPOSE:** The purpose of this study was to develop a model to estimate RMR using waist circumference (WC), an easily obtainable measure, and cross-validate it to previously published models. **METHODS:**Subjects were 10 adult men and women, ages 18 65 ye ars. RMR was measured through indirect calorimetry, %BF was measured through air displacement plethysmography, and fat mass and fat-free mass were determined from %BF and weight. Other variables collected were: weight, height, age, sex, ethnicity, body mass index, WC, hip circumference, waist-to-hip ratio, waist-to-height ratio, and %BF estimated from bioelectrical impedance analysis. Subjects were randomly divided into derivation and cross-validation samples. A multiple regression model was developed to determine the most accurate estimation of RMR in the derivation sample. The cross-validation sample was used to confirm the accuracy of the model and to compare the accuracy to published models. **RESULTS:**The best predictors for estimating RMR were body weight, r = 0.7 *p*= 0.031, age, r = -0.30, *p*= 0.012, and sex, r = 0.5 *p*= 0.018. Other factors failed to account for significant variation in the model. The derived eqa tion for estimating RMR is: RMR (kcal/day) = 8.1 1 + 8 weight) - 4.23(age) + 228 sex, M = 1, F = 0), R^2= 0.6 S EE = 17 kc al/day. Cross-validation statistics were: R^2= 0.54, p ≤0.05, SEE = 199 kcal/day, and total error = 198 kcal/day. In published models, R^2ranged from 0.4 o 0.7 S EE ranged from 19 t o 213 kcal/day, and total error ranged from 212 to 1311 kcal/day. **CONCLUSIONS:**Cross-validation to published models for estimating RMR were similar to those of the derived model; however, the total error in the derived eqa tion was lower than any of the previously published models. Several published models considerably overestimate RMR compared to the current model. The results of this study suggest that RMR can be reasonably estimated with easily obtainable measures which allow for estimation and implementation of RMR for weight management in clinical practice.

G-35 Free Communication/Poster - Fitness Assessment

Saturday, June 1, 2019, 7:30 AM - 11:00 AM
Room: CC-Hall WA2

3361 Board #49 June 1 9:30 AM - 11:00 AM

Health and Fitness Differences Between Urban and Rural Costa Rican Older Adults

Luis Solano-Mora[1], Mónica Salazar-Villanea[2], Luis E. Araya-Ortega[2], Esmeralda Valdivieso-Mora[3], David K. Johnson[4], Yamileth Chacón-Araya[2], José Moncada-Jiménez[2]. *[1]National University, Heredia, Costa Rica. [2]University of Costa Rica, San José, Costa Rica. [3]University of Kansas, Lawrence, KS. [4]University of California, Davis, CA.*
Email: jose.moncada@ucr.ac.cr

(No relevant relationships reported)

Costa Rica has one of the highest life expectancies in America, even higher than the United States. Studies addressing health and fitness in Latin American urban and rural older adults are scarce. **PURPOSE:** The purpose of the study was to test the hypothesis that older adults from rural areas present fewer negative health conditions and higher fitness than older adults from urban zones. **METHODS:** 29 pa rticipants aged 6 to 8 Urban n =18 R ural n = 110) completed a 29 item chronic diseases qe stionnaire and performed the Senior Fitness Test: a) 6 min walking test (6-MWT), b) 30-s Chair to-Stand Test, c) 30-s Arm Curl Test, d) timed up- and go test (TUG), balance time, and handgrip strength (HGS). Categorical variables were analyzed with non-parametric Chi^2 and continuous variables with 2 x2 ANOVA (residency zone x gender). **RESULTS:** Urban women reported more chest pain (χ^2 = 6 p = 0.014), more pacemakers (χ^2 = 4.70, p = 0.030), diabetes (χ^2 = 3.9 p = 0.04), and osteoarthritis (χ^2 = 5 p = 0.02 than rural women. Urban men reported more chronic low back pain (χ^2 = 5.65, p = 0.017) and depression (χ^2 = 3.9, p = 0.0 than rural men. A higher diastolic blood pressure was observed in urban compared to rural older adults (Urban = 76.2 ± 0.9 mmHg kg vs. Rural = 70.2 ± 1.3 mmHg; p ≤ 0.001). Urban older adults showed better balance time than rural older adults (Urban = 22.8 ± 0.8 vs. Rural = 18 ± 1.2 s; p = 0.003). Performance was similar between urban and rural older adults on the 6 MWT, 30-s Chair to-Stand, 30-s Arm Curl, TUG, and HGS tests (p > 0.0). **CONCLUSION:** In spite of having similar physical fitness performance, Costa Rican urban men and women showed an overall negative health profile compared to rural older adults. Balance was the only functional variable positively observed in urban older adults.

3362 Board #50 June 1 9:30 AM - 11:00 AM

A Comparison of Back Squat & Safety Squat Bar on Measures of Strength, Speed, and Power in NCAA Division I Baseball Players

Richard Meldrum, Mark DeBeliso, FACSM. *Southern Utah University, Cedar City, UT.* (Sponsor: Mark DeBeliso, FACSM)
Email: r.meldrum00@gmail.com

(No relevant relationships reported)

Sqa t exercise variations are considered a cornerstone of resistance training (RT) programs. Understanding the effectiveness of differing squat exercise variations is important for coaches and athletes in order to optimizing the effectiveness of a RT program. **PURPOSE:** The current investigation examined a comparison of the standard Olympic barbell loaded back sqa t (BS) with a sqa t performed with the safety sqa t bar (SSB). **METHODS:** Twenty eight Division I male baseball players (19 ± 1.1 years, 18 5 c m, 8 5 kg) participated in a RT program comprised of two workout sessions a week for nine weeks, performing either a BS or SSB utilizing an autoregulatory progressive resistance periodization protocol, concurrent with their existing, season-specific, RT program. Pitchers (n=14) utilized the SSB bar with the goal of minimizing stress on the shoulder and elbow joints during the execution of the sqa t. The non-pitchers (n=14) performed the Olympic barbell BS. Lower body strength (estimated 1RM sqa t: kgs), sprint speed (3 m sprint: secs), and vertical jump (VJ: cms) were assessed prior to and following the RT training period. **RESULTS:** The VJ had a significant positive improvement from pre to post RT for both the BS (pre: 7 8 1, pos t: 8 0) and SSB (pre: 2.4 7 pos t: 75.3±8.3) groups (p<0.05). The estimated squat 1RMs had a significant positive improvement from pre to post RT for both the BS (pre: 136 ± 11.0, post: 16 ± 23.7 and SSB groups (pre: 112.3 ± 14.9, post: 152.6 ± 22.0) (p<0.05). The 54.86 m sprint did not improve significantly from pre to post RT for either the BS (pre: 7.12±0.33, post: 7.05 0.26 or SSB groups (pre: 7.27 0.17 pos t: 7.19 0.20) (p>0.0). When comparing gain scores between each group there were no significant difference between the BS and SSB groups for either 3 m sprint or VJ (p>0.0). However, the estimated squat 1RM gain score for the SSB was significantly greater than the BS group (p<0.05) noting that the effect size of change from pre to post RT was 2.69 and 2.7 s tandard deviations for the BS and SSB groups respectively. **CONCLUSION:** Given that both sqa t modalities yielded approximately eqa l improvements in VJ and lower body strength, coaches and athletes can consider the SSB variation of the sqa t as a viable option for developing lower body strength and power.

3363 Board #51 June 1 9:30 AM - 11:00 AM

Assessment of Bilateral Glenohumeral Posterior Capsule Tightness in Recreational Golfers

Andrew Cannon, PT, SCS, MHS, CSCS, Jessica Wagner, Kevin Finn, FACSM. *Merrimack College, North Andover, MA.*
Email: cannona@merrimack.edu

(No relevant relationships reported)

Andrew Cannon; Jessica Wagner; Kevin Finn FACSM
Merrimack College, N. Andover, MA

Comparison of Glenohumeral Posterior Capsule Tightness between Golfers and Non-Golfers

Abstract

The primary movement of the golf swing is habitually unidirectional. Consistently the leading side, (left side of a right handed golfer) and the trail side, (right side of a right handed golfer) are asked to perform remarkably different tasks with an overall shoulder injury prevalence of between 8 1 .

Purpose. The current study examined glenohumeral posterior capsule mobility of the leading shoulder compared to the trail shoulder in recreational golfers and non-golfers. **Methods.** Participants were twenty-two recreational golfers (15 m ales, 7 females) mean age 38 ye ars(SD= 18 with at least two years of prior experience golfing and thirteen non-golfers (7 males, 6 females) with a mean age of 33.1 years (SD=12.3). All participants had bilateral glenohumeral posterior capsule mobility measured as medial epicondyle distance from exam table in inches via side lying horizontal adduction of the non weight bearing upper extremity with scapula manually stabilized. **Results.** Golfers exhibited a statistically significant (P<.001) asymmetry of glenohumeral posterior capsule mobility in their leading shoulder compared to the trail shoulder. The non-golfing participants demonstrated no statistically significant difference in right to left glenohumeral posterior capsule mobility exhibiting relatively eqa l measurements bilaterally. **Conclusions.** The sample of golfers demonstrated an asymmetry in glenohumeral posterior capsule mobility in leading to trail shoulders