ab/adduction and flexion/extension of both the shoulder and the elbow with a flat paddle-type device (782 cm^2 of projected frontal area) in each hand; and (b) 3 sets of exercises performed with dumbbells: (i) standing horizontal shoulder abduction, (ii) horizontal shoulder adduction, and (iii) shoulder flexion; and with pulley: (iv) standing pull-over, (v) biceps curl, and (vi) elbow extension. Rest between sets was 1-2 min. Aquatic exercises were performed at a pace that permitted the maximum number of repetitions in 15 sec. Weight exercises were performed with a load that permitted the same number of repetitions as the corresponding aquatic exercise pace. Cortisol blood samples were obtained from an antecubital vein in basal status, immediately after finishing each workout, and after 60 min of rest (60REST).

RESULTS: Basal cortisol was 22.83±6.67 ng/ml. Post-workout and 60REST values were: (i) aquatic: 26.71±5.73 and 24.02±10.17 ng/ml, respectively; (ii) weights: 24.29±8.12 and 18.96 ± 6.45 ng/ml, respectively. There were significant (p<0.05) differences in cortisol levels following both workouts compared to basal values ($\chi^2(4)=8.800$). There was also a significant increase in cortisol immediately after the aquatic workout compared to weights (Z=-1.820) and a significant decrease in cortisol between post- workout and 60REST with weights (Z=-2.240).

CONCLUSIONS: Cortisol levels were higher immediately and 60 min after the aquatic workout compared to weights. The higher cortisol level and the slower pace of recuperation could indicate that this type of aquatic training provokes a higher intensity. This could be due to the higher stabilization needed to maintain postural control in the water.

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269 Board #110 May 30 9:30 AM - 11:00 AM

A Call for Physical Activity Guidelines to Be Established in Equatorial Africa

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(No relevant relationships reported)

Current guidelines recommend adults perform a minimum of 30-60 minutes of moderate-intensity physical activity (PA) at least 5 days a week or vigorous PA on at least 3 days. Throughout Equatorial Africa, these recommendations are largely unmet and unknown. Among adults in rural areas, rates of sedentary behavior are reported to be 65-72%; in urban areas, where supplies are more accessible, 78-80% of men and women are sedentary. Geographic prevalence of metabolic syndrome reflects this with a 5-fold increase in urban populations. Currently, data are limited on how much PA should be prescribed to reduce the incidence of illness and physical suffering in Equatorial African populations.

PURPOSE: To evaluate the effect of PA on health outcomes among Ugandan men and women.

METHODS: The Uganda National Household Survey gathered data from a random sample of Ugandan homes between 2012 and 2013. Variables related to PA were limited; we used "hours spent gathering firewood" and "hours spent collecting water" as representations of daily activity. Dependent variables were whether subjects experienced an injury in the last 30 days, the number of days they reported "suffering" from illness or injury during that period, and the number of times they had to cease activity owing to illness or injury. Linear regressions tested the effect of PA on physical health outcomes.

RESULTS: Across the total sample, more hours spent gathering firewood (p<0.001) and more hours spent collecting water (p<0.001) each individually associated with reduced frequency of suffering and the number of times subjects had to stop activity owing to illness or injury. Time spent gathering firewood (p=0.328), water (p=0.346), or both (p=0.982) had no relationship with the incidence of injury in the last 30 days; the implication is that illness associates more strongly with PA than does injury. As subjects performed more PA, they reported less suffering and less obstruction of daily tasks.

CONCLUSION: These data offer a modest indication that PA and health are inextricable: increased engagement in activity corresponds to better health and less suffering. Owing to these preliminary associations and the lack of comprehensive data, there is a demonstrable need for governmental guidelines for PA and potentially the establishment of a Ugandan College of Sports Medicine.

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270 Board #111 May 30 9:30 AM - 11:00 AM

Does Joint-angle Specificity After Short-term Isometric Strength Training Have A Neural Basis?

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(No relevant relationships reported)

The functional adaptations to isometric RT have been found to different between, and highly specific to, the type of contractions performed e.g. explosive vs sustained contractions. However, it is unknown if isometric resistance training combining sustained contractions and brief explosive contraction (EC) increases both explosive and maximum strength, and if the strength gains would be specific to the training angle (joint angle specificity) explained by neural drive specific to the training angle.

PURPOSE: The primary aim of the present study was to investigate if a short-term intervention of isometric RT, with brief EC and sustained maximum voluntary contractions (MVC), increased both maximum and explosive strength. The second aim was to investigate the joint angle specificity of adaptations in strength and neural drive.

METHOD: Twenty- two healthy males completed 4 weeks of either RT (RT group; n=13; 22 ± 3 years; 1.78 ± 0.07 m; 73 ± 7 kg) or habitual activity (CON group n=9; 23 ± 3 y; 1.79 ± 0.08 m; 75 ± 8 kg). All training sessions were performed isometrically (65° knee joint angle where 0° is full knee extension; 14 sessions) performing unilateral knee extension EC [3x10 repetitions (~1s)] followed by MVC [3×6 repetitions (3s)]. Isometric pre- and post-training measurements of torque were made at five different joint angles (35°, 50°, 65°, 80° and 95°) during: MVC; EC and evoked twitch contractions. Surface electromyography (EMG) amplitude measurements from the quadriceps femoris during voluntary contractions were normalised to maximum peak-to-peak compound muscle action potential.

RESULTS: Changes in MVT were higher for RT than CON at the training angle (65°; P=0.001) and the two more extended angles (35° and 50°; P≤0.047). Normalized EMG at MVT increased more, or had a tendency to increase more, for RT vs CON at these same angles (50°, P=0.023; 35° and 65°, P≥0.073). Explosive torque, EMG during EC and twitch contractions did not show time x group interactions (P≥0.123).

CONCLUSION: Resistance training with brief EC and sustained MVC increased MVT and associated neural drive, but did not increase explosive strength or neural drive during the explosive phase of contraction. We also found angle specific changes in neural drive that appeared to underpin the joint angle specificity of MVT improvements after isometric RT.

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271 Board #112 May 30 9:30 AM - 11:00 AM

Effects Of A Smartphone-based Intervention On Adults' Physical Activity, Self-efficacy, And Enjoyment

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(No relevant relationships reported)

PURPOSE: Smartphone applications provide an opportunity for implementing physical activity (PA) interventions remotely. However, little research has been published to date on their effects. The purpose of the study was to test the effectiveness of *efitbuddy,* a theory-based PA smartphone application, on young adults' PA and motivational beliefs through a four-week intervention.

METHODS: A quasi-experimental design with control group was used to examine the effects of *efitbuddy* on participants' PA. 274 college students (167 females, mean age = 19.35±2.09 years) attended baseline and posttests and change scores were computed for each dependent variable (DV). After the baseline test, participants in the intervention group (n=187) downloaded *Efitbuddy* and used it daily for four weeks. *Efitbuddy was* a smartphone application developed to promote individual's PA and included four behavior change techniques such as self-monitoring, setting goals, and provision of general health information. PA participation, self-efficacy, and exercise enjoyment were selected as the DVs of the study. A Pearson's correlation analysis was employed on the raw data to examine if the data were suitable for multivariate analyses. The results displayed moderate linear relationships between the pretest and posttest scores on three DVs. Therefore a 2 (group) x 2 (time) x 2 (gender) Multivariate Analysis of Variance (MANOVA) was conducted to examine the differences in the dependent variables. Wilk's lambda was used to decide the statistical significance of the multivariate model.

RESULTS: There were no multivariate statistically significant interactions for Group x Time x Gender (Wilks's Λ = 0.996, $F_{(6, 269)} = 0.687$, P = 0.560), for Time x Gender (Wilks's Λ = 0.003, $F_{(6, 269)} = 0.508$, P = 0.677), and for Group x Time (Wilks's Λ = 1, $F_{(6, 269)} = 0.008$, P = 0.999). However, the results from the MANOVA yielded a significant interaction for Gender