CONCLUSIONS: The SWV results suggest that AT becomes stiffer and more resilient at its resting length and is subject to less mechanical stress under stretch by the intervention. The observed changes were accompanied by favorable changes in biochemical markers. Our results suggest efficacy of the present amino acid mixture for the faster healing of Achilles tendinopathy.

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Characteristics Of Bone Mineral Density In College Students With Low/Normal Weight Obesity

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PURPOSE: Investigate the bone mineral density(BMD) of college students, and analyze the characteristics of the BMD of low/normal obese college students.
METHODS: The subjects of the study were 519 low/normal-weight students(18-23 years old), including 383 women and 136 men. The dual-energy X-ray test method was used to detect the percentage of body fat and BMD of college students. The BMD of obese people with low/normal weight was compared with those of non-obese people. Partial correlation analysis was used to analyze the relationship between body mass index(BMI), body fat percentage(BF%) and BMD.
RESULTS: 1)Among the low-weight male college students, the whole body BMD, T-value and Z-value of the low weight obese students were lower than those of the low weight non-obese students (2.01±0.22 vs 1.82±0.04 g/cm^2; -0.02±0.15 vs -1.10±0.24;-0.01±0.43 vs -0.94±0.64,*P*<0.01);2)Among low-weight male college students, the BMD of the upper limbs, thighs, ribs, and pelvis of the low weight obese students was lower than that of the low weight non-obese students (0.68±0.03 vs 0.57±0.01; 1.20±0.04 vs 0.96±0.02;0.87±0.04 vs 0.79±0.06;0.78±0.02 vs 0.69±0.04; 0.91±0.06 vs 0.77±0.06 g/cm^2,*P*<0.01);3)Among low-weight female college students, the body BMD of the low weight obese students was lower than that of the low weight non-obese students (1.31±0.29 vs 1.13±0.48 g/cm^2; *P*<0.05);4)Among low-weight female college students, the BMD of the head, upper limbs, thighs, and trunk of the low weight obese students was lower than that of the low weight non-obese students (1.48±0.57 vs 1.23±0.72; 0.74±0.13 vs 0.65±0.20;1.07±0.10 vs 1.02±0.11;0.86±0.07 vs 0.82±0.07 g/cm^2,*P*<0.05); 5)In male college students, BMI was positively correlated with BMD, T-value and Z value (r=0.694; 0.676; 0.612,*P*<0.01), while BF% was negatively correlated with BMD, T-value and Z value (r=-0.523; -0.509; -0.488,*P*<0.01); 6)In female college students, BMI was positively correlated with T-value and Z-value(r=0.455; 0.261,*P*<0.01), and BF% was negatively correlated with T-value and Z-value(r=-0.224; -0.225,*P*<0.01).
CONCLUSIONS: Low/Normal weight obese college students have poorer bone mineral density. Intervention to promote BMD in this population is of great significance for the prevention of osteoporosis.

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Age And Motor Performance: An Analysis Of Biomechanical Capacities Across The Lifespan

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Advancing age associates with losses in strength and motor function. As technology enables more precise motor assessment, it is important to update our understanding of the relationship between age and performance.
PURPOSE: To evaluate the effect of age on different biomechanical capacities of upper limb motions.
METHODS: We tested 183 males and 48 females (ages 7-79) on a Proteus device. They performed 9,289 total sets of 9.6±3.2 repetitions across 10 exercises: internal rotation (IR) and external rotation (ER) at 0° shoulder abduction, single-handed biceps curl (BC1), triceps extension (TE1), chest press (CP1), and horizontal row (HR1), and double-handed biceps curl (BC2), triceps extension (TE2), chest press (CP2), and horizontal row (HR2). We measured power, acceleration, velocity, deceleration, and consistency of motion in serial repetitions. We stratified subjects into age groups by decade and performed multivariate tests to evaluate categorical differences by age and sex.
RESULTS: Among men, composite scores across all exercises found peak performance in the 20-29yr group for power, acceleration, velocity, and deceleration (p<0.005). Consistency was highest in the 50-59yr group; categorical comparisons to subjects <30yr were significant (p<0.001). Precise estimates of age revealed highest power to occur between the ages of 16-27 (p<0.001), acceleration from 20-26 (p<0.001), velocity from 17-26 (p<0.001), deceleration from 20-28 (p<0.001), and consistency from 30-72 (p<0.001). Among women, peak power, velocity, and deceleration occurred in the 20-29yr group. Acceleration improved through 30-39yr, followed by a steep decline (p<0.001). Consistency improved through 50-59yr; differences compared to subjects <30yr and >70yr were significant (p<0.05). Across both sexes, acceleration was unaffected by age in ER (p=0.409), BC2 (p=0.133), TE1 (p=0.164), TE2 (p=0.867), and CP1 (p=0.390), and deceleration was unaffected in ER (p=0.522), BC2 (p=0.107), HR1 (p=0.658), HR2 (p=0.200), and CP1 (p=0.087).
CONCLUSIONS: Unique features of motor decline may arise at different ages, and are likely to differ between men and women. In our sample, men between the ages of 16-28 exhibited peak performance in all mechanical domains except consistency while women exhibited lower peaks but more gradual decline.

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Stress Fracture Risk Assessment In Intercollegiate Distance Runners

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Bone stress injuries (BSI) are prevalent in endurance sports and often require activity restriction and removal from high performance environments. Multiple factors contribute to BSI yet translating these to a predictive model for BSI prevention remains elusive. The Female Athlete Triad Risk Assessment Tool (DeSouza 2014) has been adapted to identify women and men at higher risk for BSI (Tenforde 2017; Kraus 2019) but does not account for changes in modifiable factors that influence BSI, such as sleep (Finestone 2008).
PURPOSE: Confirm use of the modified Female Athlete Triad Risk Assessment tool to predict BSI and compare relative risks (RR) from the tool to those from sleep surveys taken over a competitive season.
METHODS: Distance runners from an NCAA DI Cross Country program completed pre-season surveys assessing injury history, energy availability, and menstrual status (women). Areal bone mineral density (hip and spine) and BMI were measured. Prospective BSI risk scores were stratified according to Tenforde (2017). Sleep hygiene was assessed using a validated longitudinal survey (Bender 2018) pre- and mid-season. BSI was monitored over fall and winter seasons.
RESULTS: ***Women:*** 24/30 enrolled women completed all items. Compared to low-risk athletes, cumulative risk scores between 2-5 showed a BSI RR of 3.8 while risk scores ≥6 showed BSI RR of 5.25 (Fig 1A). A worsening of sleep greater than 4 pts on a 17 pt scale was associated with an increased BSI RR of 4.5 (95% CI 1.3-15.3) (Fig 1B). *Men:* 19/25 enrolled men completed all items. Low incidence of BSI (n=1, medium risk) precluded a meaningful calculation of BSI risk.
CONCLUSIONS: In women, BSI was associated with increased total risk score. This RR pattern was consistent with those previously noted by Tenforde (2017). Longitudinal assessment of sleep alone significantly predicted BSI when sleep scores worsened by ≥4 points. Thus, predictive tools that incorporate sleep may better identify athletes at greater risk for BSI.