

**PURPOSE:** Use the network meta-analytic approach to determine the effects of different types of exercise (aerobic, strength training, or both) on adiposity in overweight and obese children and adolescents.

**METHODS:** Direct and indirect randomized exercise intervention trials  $\geq$  4 weeks that were published in any language up to June 16, 2018 and assessed body mass index (BMI) in kilogram-meters-squared, fat mass (kg), or percent body fat in overweight and obese children 2-18 years of age were eligible. Studies were retrieved by searching seven electronic databases, cross-referencing, and expert review. Dual selection and data abstraction were conducted. Results were pooled using random-effects, restricted maximum likelihood models. Surface under the cumulative ranking curves (SUCRA) were used to establish a hierarchy of exercise interventions (aerobic, strength, both). A two-tailed alpha value  $\leq 0.05$  and non-overlapping 95% confidence intervals were considered statistically significant.

**RESULTS:** Fifty-seven studies representing 127 groups (73 exercise, 54 control) and up to 2,792 participants (1,667 exercise, 1,125 control) met the criteria for inclusion. Statistically significant reductions in BMI, fat mass, and percent body fat were observed in aerobic vs. control comparisons (BMI, mean, 95% CI, -1.0, -1.4 to -0.6; fat mass, -2.1, -3.3 to -1.0 kg; percent fat, -1.5, -2.2 to -0.9%) and combined aerobic and strength vs. control comparisons (BMI, -0.7, -1.4 to -0.1; fat mass, -2.5, -4.1 to -1.0 kg; percent fat, -2.2, -3.2 to -1.2%). A statistically significant reduction in percent fat was also found for strength vs. control comparisons (-1.3, -2.5 to -0.1%). Based on SUCRA results, combined aerobic and strength training was ranked first for improving both fat mass (kg) and percent body fat while aerobic exercise was ranked first for improving BMI.

**CONCLUSIONS:** Combined aerobic and strength training is optimal for improving adiposity-specific outcomes in overweight and obese children and adolescents. Supported by AHA Grant 17GRNT33630158

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**Freshmen Physical Activity Habits And Senior Fitness Levels: Examining A Healthy Transition To College**

Melissa Bopp, FACSM, Oliver W.A. Wilson, Zack Papalia, Christopher Bopp. *Pennsylvania State University, University Park, PA.*

Email: mjb73@psu.edu

(No relationships reported)

The years in post-secondary education are important for building healthy lifestyle habits to transfer into adulthood. Previous research has indicated that physical activity (PA) declines during the years of college, and Exercise is Medicine on Campus (EIMOC) programs are poised to help address this.

**PURPOSE:** To examine how freshmen exercise patterns and perceptions were related to fitness and physical activity in senior year of college at a large Northeastern university.

**METHODS:** A volunteer sample of university seniors (n=439) completed a fitness assessment (YMCA bicycle test) and an online survey which addressed their PA participation, freshman exercise perceptions and engagement in on-campus exercise opportunities. Pearson correlations examined the relationship between fitness and PA with freshman variables. T-tests examined differences in fitness and PA by freshman variables.

**RESULTS:** The sample was predominately male (n=254, 59.3%) and Non-Hispanic White (n=343, 78.4%). Many (n=232, 53%) reported being more active currently than in freshman year. Most (n=178, 52.7%) reported that they were well informed of campus exercise options, 28.5% (n=125) reported doing intramural sports and 10% (n=44) did club sports as freshmen. Current VPA was associated with being better informed of options for exercise on campus as a freshmen (r=.11, p=.04), campus fitness center membership as a freshmen (p=.004), and freshman club sport participation (p=.004). VO2max was associated with club sport participation as a freshman (p<.001). Challenges with time management (n=305, 85.4%) and lack of motivation (n=226, 63.6%) were frequent barriers to exercise as freshmen. Motivation challenges as a freshman was negatively associated with current VPA (r=-.21, p<.001) and VO2max (r=-.19, p=.001). Students indicated that programs partnering with an exercise buddy (n=255, 74.1%) or events around outdoor exercise/outings (n=179, 52%) would have been the most useful to motivate them as freshmen.

**CONCLUSIONS:** This study examined how exercise patterns and perceptions as a freshman were related to PA participation and fitness as a senior. Findings indicate the importance of developing EIMOC programs and strategies to specifically help freshmen transition to college campuses and engage in healthy behaviors.

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**Physical Play with Children Predicts Better Hematological Health; Hematological Health Predicts Cognitive and Behavioral Development**

Kendall D. Bietsch<sup>1</sup>, Cynthia Villalobos<sup>1</sup>, William E. Herrin<sup>1</sup>, Jessica A. Avalos<sup>1</sup>, Norah Madaya<sup>2</sup>, Courtney D. Jensen<sup>1</sup>. <sup>1</sup>University of the Pacific, Stockton, CA. <sup>2</sup>Uganda Bureau of Statistics, Kampala, Uganda.

Email: k\_bietsch@u.pacific.edu

(No relationships reported)

More than half of all Ugandan children under the age of 5 are anemic. The consequences of anemia are amplified during this period as it is critical to cognitive and physical development. Adequate physical play may bolster hematological health, and in turn cognitive and behavioral development, but this has not been previously explored.

**PURPOSE:** Examine the effect of play on serum hemoglobin (Hb) among children under the age of 5 in Uganda, and to test the effect of Hb on cognitive and behavioral development.

**METHODS:** We analyzed the 2016 Demographic Health Surveys of Uganda, Children's Records dataset. Anemia testing was performed on children age 6-59 months whose parents or guardians consented (N=3,944). Hb levels were collected to determine the incidence and severity of anemia. Children with Hb  $\geq 11$  g/dL were not considered anemic. Multiple linear regression was used to identify the effect of physical play with parents on Hb. Logistic regression analyses were used to test the effect of Hb on the odds that children were developing literacy and appropriate behaviors.

**RESULTS:** On average, children were  $31.3 \pm 15.6$  months old and had  $10.9 \pm 1.61$  g/dL of Hb; 54.6% were anemic. Holding constant the mothers' height and weight, the child's age, height, and weight, and the region (controlling for differences in culture, geography, and altitude), if the mother or father played with their children, the children's Hb was elevated by 0.14 g/dL (p=0.019); if the mother smoked, the children's Hb decreased by 0.3 g/dL (p=0.036). Holding constant the child's age, height, and weight, increased Hb associated with increased odds of behaving appropriately around other children ( $\beta=0.38$ ; p=0.001), being capable of performing tasks independently ( $\beta=0.13$ ; p=0.036), being able to read and count to 10 ( $\beta=0.19$ ; p=0.002), being able to read at least 4 words ( $\beta=0.31$ ; p<0.001), and being able to identify at least 10 letters ( $\beta=0.32$ ; p<0.001).

**CONCLUSIONS:** In a sample of children from Equatorial Africa, physical play with parents predicted elevations in Hb. In turn, elevated Hb predicted more advanced cognitive and behavioral development. Implementing physical activity in parent-child interactions may have value as a primary prevention for anemia and it may also help advance the child's growth and maturation.

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**Health/Fitness Assessments of Resident Physicians by Exercise Science Interns - Exercise Prescriptions and Follow-Up Measures**

Rachel R. Swinford, Stephen M. Fallowfield, Brain D. Krohn, NiCole R. Keith, FACSM. *IUPUI, Indianapolis, IN.* (Sponsor: NiCole Keith, FACSM)

Email: rswinfor@iupui.edu

(No relationships reported)

Resident physicians' postgraduate training and fitness status are important predictors of their decision to provide physical activity (PA) counseling to their patients. Providing instruction about these topics within medical education may improve residents' health/fitness outcomes and increase the likelihood of residents providing PA counseling to their patients.

**PURPOSE:** To assess the health/fitness status of resident physicians during a healthy lifestyle rotation.

**METHODS:** We measured 187 resident physicians' health/fitness status for one required assessment and two optional follow-up assessments that were on average, 9.5 months apart. Residents learned their results, received an exercise prescription, and were supported by an Exercise Science Student Trainer during one PA session. Residents could then exercise independently at an employee only fitness facility, elsewhere, or not at all.