PURPOSE: There is an increased interest in exploring the association between fitness components with cognitive development in youth in recent years. However, most of the studies so far have focused on healthy weight young people with little evidence with excessive fat accumulation population. To examine the association of health-related physical fitness with attention capacity in Latin-American children and adolescents and to examine whether body fat is moderator of the association between them.
Study design: A cross-sectional study involving 201 children and adolescents with overweight and obesity (12.1 ± 2.1 years old; 34.3% girls) from Chile (The Active-Start study) and Colombia (HEPAFIT study). We assessed physical fitness components (i.e., muscular strength, speed-agility, and cardiorespiratory fitness) using the ALPHA and FUPRECOL batteries. Attention capacity was measured by the d2 test. Lineal regression and moderation analyses were conducted.
RESULTS: Linear regression analysis adjusted for potential confounders (age, sex, body fat, peak height velocity, mother education and study [i.e., Active-Start or HEPAFIT]) revealed association between speed agility (ß=-7.7; p=0.030) and cardiorespiratory fitness (ß=4.5; p<0.001) with attention capacity. The Johnson-Neyman technique revealed a significant relationship between cardiorespiratory fitness and muscular strength and attention capacity when body fat was below, but not above, 34.8% (20% of sample) and 29.5% (48% of sample), respectively.
CONCLUSIONS: Cardiorespiratory fitness and speed-agility are associated with higher attention capacity in youth with overweight and obesity, but body fat seems to moderate these relationships. Randomized controlled trials in this population would help to better understand whether improvements in different components of physical fitness leads to better attention capacity by a reduction in their body fat.

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285 Board #101 May 27 9:30 AM - 11:00 AM

Impact Of School Fitness Environment On Children'S Fitness: A Mixed Method Study

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(No relationships reported)

OBJECTIVE: While school fitness environment is known to have a significant impact on children's physical activity and fitness, no quick, easy, yet accurate tool is available to assess school fitness environment. The purpose of this study was to develop such a tool and validate it using a contracting-group method.
METHOD: After a comprehensive search on the literature, a check list of school fitness environment, including items in sports facilities, role of PE teachers, training methods by PE teachers, perceived values by principals and teachers and students' reported PE participation etc., was developed. An evaluation team consisting of one researcher and two graduate students was formed and trained. The team then went to two schools, A and B, in Jiujiang city, China, to interview the principals, PE teachers, students in each school, went over the school sport facility, as well as tested a group of Grade 9 students' aerobic fitness (1000-M run for boys and 800-M run for girls).
RESULTS: A total 219 students (106 boys, 113 girls) in School A and 235 students (125 boys,110 girls) in School B were tested and their aerobic fitness level were evaluated using the 2018 high school entrance exam (HSEE) criterion. After comparing with their rating and some discussions, School A was rated having a better school fitness environment and students' fitness performance (running time in seconds) and corresponding t-test comparison further supported the observation:

	School A	School B	*P*
Boys (1000-M in s)			
Total	234.0 ± 28.4	242.5 ± 30.8	< .05
HSEE Good & Above	221.4 ± 14.5	227.1 ± 11.8	< .05
Girls (800-M in s)			
Total	216.1 ± 22.6	231.0 ± 27.8	< .05
HSEE Good & Above	211.3 ± 14.4	215.6 ± 13.1	< .05

CONCLUSIONS: With a combination of qualitative and quantitative methods, a simple school fitness environment tool was developed, and by comparing students' aerobic fitness from two schools, its initial validity evidence was collected and confirmed.

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286 Board #102 May 27 9:30 AM - 11:00 AM

Physical Activity, Physical Fitness And Body Mass Index Among Elementary School Children In The Arctic Area

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The World Health Organization recommends that children accumulate at least 60 minutes of moderate-to-vigorous-intensity physical activity (MVPA) daily. However, knowledge about the association between physical activity (PA), physical fitness and body mass index (BMI) among elementary school children in the Arctic is limited.
PURPOSE: To examine the association between PA levels, physical fitness and BMI in elementary school children in Northern Norway.
METHODS: Elementary school children in 1st, 3rd, 5th and 7th grade were recruited to wear an accelerometer (wGT3X-BT**,** ActiGraph, LLC, Pensacola, United States) for seven consecutive days (n=216). PA was categorized according to intensity, and dichotomized into reaching the PA recommendations or not. Physical fitness was measured by using Test of Physical Fitness (Fjørtoft et.al. 2011) consisting of a nine-item compound motor activity score that includes various combinations of endurance, strength, agility, balance, and motor coordination, which is calculated as total physical fitness based on z-scores. BMI (kilogram/height ^{2}) was used as body composition measure.
RESULTS: In total, 94 (43%) of 216 the children reached the recommendation of 60 min MVPA per day. There was a significant difference (p<0.001) in total physical fitness score between boys (3.01) and girls (-2.35). A positive association between physical fitness score and reaching the PA recommendations was observed in 3rd, 5th and 7th grade (p<.05). BMI was inversely associated with physical fitness in 5th and 7th grade (p<0.05) but not in 1st and 3rd grade. There was no significant association between those who achieved the PA recommendations and BMI.
CONCLUSION: Children in elementary school who reach the recommendations for PA seem to have a higher score on the physical fitness test, except for the first graders. BMI was not related to physical fitness or reaching PA recommendations except an inverse association between BMI and physical fitness in higher grades.

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287 Board #103 May 27 9:30 AM - 11:00 AM

Talk Test As A Measure Of Exercise Intensity In Children

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INTRODUCTION: The Talk Test (TT) is a well-accepted measure of exercise intensity and is a useful surrogate of ventilatory (VT) and respiratory compensation (RCT) thresholds in sedentary, fit, athletic, and cardiac populations. Recently, the TT has also been shown to reflect these same markers in children.

PURPOSE: The present study was designed 1) to replicate TT results during incremental exercise in children, and 2) to evaluate the ability of the TT to predict when the subjects would be above (-TT) or below (+TT) VT intensity during interval exercise**.**
METHODS: Healthy pre-pubertal children (5m, 5f) were studied using the TT and gas exchange during incremental exercise to determine the match between TT stages and VT. Another group of healthy pre-pubertal children (7m, 6f) were studied both during incremental and stochastic exercise, in order to determine how well TT responses during stochastic exercise predicted whether the children were above or below VT**.**
RESULTS: During incremental exercise, there was good correspondence between the VO_2@VT and the VO_2@ the last positive (LP) (r=0.79) and the equivocal (EQ) (r=0.75) stages of the TT, which match earlier findings from our laboratory (Giddings et al., 2018; LP TT, r=0.62 & EQ TT, r=0.75). During stochastic exercise, correct matching of predicted vs. observed +TT and predicted vs. observed -TT were present 73% of the time. Discordant results were present 27% of the time. These findings match earlier findings from our laboratory in adults relative to the matching of observed vs. predicted results.
CONCLUSION: The TT behaves as a similar surrogate of VT in children, as it does in adults, during both incremental and stochastic exercise.

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Effect Of Exercise Intervention On Physical Fitness Factors In Elementary School Children

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Sports have been very popular after-school activities for children. It is quite likely that sports have a positive effect on child growth in many ways. The Ministry of Education, Culture, Sports, and Technology of Japan has reported that the total scores of physical fitness tests differ greatly between those who exercise regularly and those who do not. However, it is not clear how exercise habits affect physical fitness factors during childhood. Such detailed knowledge would be useful in promoting long-term athlete development and improving physical fitness throughout life.
PURPOSE: To explore the effect of exercise intervention on physical fitness factors in elementary school children.
METHODS: The subjects of this study were 1,079 1st- to 6th-grade male elementary school students. A questionnaire survey was conducted to investigate the exercise and lifestyle habits and the results of physical fitness tests conducted at Japanese elementary schools. The existence or not of exercise habits after-school activities and the results of physical fitness tests were used for the analysis. The physical fitness test includes measurements of grip strength, sit-ups, sitting front stretches, side steps, twenty-meter shuttle run, fifty-meter run, standing long jump, softball throw, height, and weight.
RESULTS: There were no significant differences between grades in the existence or not of exercise habits about height and weight. After the 3rd grade, children with exercise habits showed higher performance on sit-ups, side steps, the twenty-meter shuttle run, the fifty-meter run, and softball throw than children with no exercise habits. There was little difference in grip strength, sitting front stretches, and long jump between children with exercise habits and those without.
CONCLUSION: Endurance, speed, and agility develop greatly in elementary school children who exercise regularly. However, exercise habits have little effect on single strength and power. In addition, differences between children with and without exercise habits are observed after the 3rd grade.

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290 Board #106 May 27 9:30 AM - 11:00 AM

Changes In Cardiorespiratory Fitness Among Children In The Hearts And Parks Heathy Lifestyle Intervention

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(No relationships reported)

In children, resting heart rate (RHR) and heart rate recovery (HRR) serve as markers of cardiorespiratory fitness (CRF), predicting future cardiovascular morbidity and mortality risk. The 2018 Physical Activity Guidelines for Americans recommends children should engage in at least 60 minutes of daily, moderate-to-vigorous exercise. However, less than one-quarter of children in the U.S. meet this recommendation.
The Hearts and Parks randomized controlled trial utilizes a novel clinic-community intervention consisting of clinic-based behavioral support and nutrition education, as well as physical activity through the Bull City Fit program for children 5-17 y with a body mass index (BMI) $\geq 95^{th}$ percentile. One aim of the trial is to assess the efficacy of the intervention for improving CRF.
PURPOSE To examine the effect of the Hearts and Parks intervention program on RHR and 1-min HRR.
METHODS To date, 49 participants (age: 9.9 ± 3.3 y; non-Hispanic: 61%; males: 45%) completed ≥ 6 months of the Hearts and Parks intervention program and were included in this preliminary analysis. Pre- and post-intervention anthropometric and physical fitness assessments occurred at Duke Children's Primary Care Clinic. CRF was assessed via the 3-min YMCA Bench Stepping Test, adapted for children 5-18. Heart rate was measured via pulse-oximetry prior to the test (RHR), immediately upon test completion, and 1-min after the test. HRR was calculated as the difference between the 1-min post-test and immediate post-test values. Gender-specific paired t-tests were used to determine whether post- minus pre-intervention values were significantly different ($\alpha = 0.05$).
RESULTS In females only, there was a significant decrease of 5.3 ± 13.0 BPM in RHR following the intervention (p=0.02). There was no significant change in HRR following the intervention for males or females.
CONCLUSION Our results showed a beneficial change in RHR for females completing at least 6 months of the Hearts and Parks intervention program. However, we did not observe any significant changes in HRR after the intervention. These preliminary results suggest the potential for this novel clinic-community intervention framework to have beneficial changes in some markers of CRF in children who have obesity.

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291 Board #107 May 27 9:30 AM - 11:00 AM

COMPARISON BETWEEN OBESITY RATES AND PHYSICAL ACTIVITY LEVELS AMONG ADOLESCENTS IN SINGAPORE

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This Asia-Fit study focused on the physical index of adolescents from Singapore (SGP), providing an overall indication of living habits that may affect obesity levels.
PURPOSE: To compare physical activity (PA) levels and obesity rates among SGP adolescents.
METHODS: A total of 1648 adolescents from SGP ((age: 13.49 ± 1.21 years, height: 159.76 ± 8.94 cm, weight (WT): 51.98 ± 13.41 kg, body mass index: 20.21 ± 4.22 $k•gm^{-2}$, body fat percentage (BF%): 21.54 ± 10.21 %)) participated in this study. A series of physical tests (15m youth Progressive Aerobic Cardiovascular Endurance Run (PACER) test, one-legged sit-and-reach (SRT), handgrip strength (HS) test, and 1-minute sit-up test (SUT)), a PA questionnaire and anthropometric measurements were collected from schools all over Singapore.
RESULTS: There were significant correlations between WT and BMI (WT: 51.98 ± 13.41 kg; BMI: 20.21 ± 4.22 $k•gm^{-2}$; r = 0.90, p = 0.00), BMI and BF% (BMI: 20.21 ± 4.22 $k•gm^{-2}$; BF%: 21.54 ± 10.21 %; r = 0.78, p = 0.00), vigorous exercise (VE) and moderate exercise (ME) (VE: 3.19 ± 2.07 days ; ME: 3.06 ± 2.06 days; r = 0.46, p = 0.00). Negative significant correlation was found between VE and WT (3.19 ± 2.07 days; WT: 51.98 ± 13.41 kg; r = -0.06, p = 0.03). No significant correlation was observed between ME and BMI (3.06 ± 2.06 days; 20.21 ± 4.22 $k•gm^{-2}$; r = -0.04, p = 0.13), VE and BF% (VE: 3.19 ± 2.07 days; BF%: 21.54 ± 10.21 %; r = -0.04, p = 0.09). 89.5% adolescents participated in ME (3.06 ± 2.06 days), 10.5% did not indicate participation. 70.7% adolescents participated in VE (3.19 ± 2.07 days), 12.1% did not indicate participation. 2.8% adolescents adhered to the American College of Sports Medicine (ACSM)'s