9-20-2021

Exercise is Medicine: Health and Fitness at the U of A and Beyond

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Exercise is Medicine: Health and Fitness at the UofA and beyond

September 20, 2021
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Organized Sport Trajectories from Childhood to Adolescence and Health Associations

John K. Howie, K. McKeel, Anne J. Smith, and Leon M. Straker
Physiotherapy and Exercise Science, Curtin University, Perth, WESTERN AUSTRALIA

ABSTRACT

The 3-year evolution of a preschool physical activity intervention through a collaborative partnership between research interventionists and preschool teachers


The study investigated the effectiveness of an intervention to increase physical activity in preschool children. A total of 45 children were randomly assigned to the intervention or control group. The intervention group received a 12-week program of physical activity, while the control group received a program of sedentary activities. The intervention was delivered by preschool teachers, who were trained in the program. The study found that the intervention was effective in increasing physical activity levels in preschool children. The intervention was also well-received by the teachers, who reported that it was easy to implement and had a positive impact on the children.

Organized Sport Trajectories from Childhood to Adolescence and Health Associations

The study investigated the relationship between participation in organized sport in childhood and adolescence and health outcomes in adulthood. A total of 100 participants were recruited from a community setting. The participants were followed up at ages 10, 14, and 18 years, with measures of physical activity, body composition, and health outcomes. The study found that participation in organized sport in childhood and adolescence was associated with better health outcomes in adulthood, including lower body mass index and lower risk of chronic diseases.

Acute Effects of Classroom Exercise Breaks on Executive Function and Math Performance: A Doce–Response Study

E. K. Howie, Jeremy Scrigg, and Russell R. Pan
Department of Exercise Science

The study investigated the effects of classroom exercise breaks on executive function and math performance. A total of 50 children were randomly assigned to a control or exercise condition. Children in the exercise condition participated in 5-minute exercise breaks during the school day, while children in the control condition did not. The study found that classroom exercise breaks were effective in improving executive function and math performance. The exercise breaks were also well-received by the teachers, who reported that they were easy to implement and had a positive impact on the children.

Physical Education teacher at the University of Arkansas
Collaboration

How can you become involved with Exercise is Medicine?

“If exercise could be packaged in a pill, it would be the single most widely prescribed and beneficial medicine in the nation.”

- Robert Butler, National Institute on Aging
What is Exercise is Medicine?

A global health initiative managed by the American College of Sports Medicine (ACSM)

**Goal:** To make physical activity assessment and exercise prescription a standard part of the disease prevention and treatment paradigm for all patients.

Connects health care with evidence-based physical activity resources for people everywhere and of all abilities.

Calls upon universities and colleges to promote physical activity as a vital sign of health by:

- Making movement a part of the daily campus culture
- Assessing physical activity at every student health visit
- Providing students with the tools necessary to strengthen healthy physical activity habits that can last a lifetime
- Connecting university health care providers with university health fitness specialists to provide a referral system for exercise prescription.

What is our assessment of physical activity on campus?
Daniels BT et al, Manuscript in preparation

The latest data

- **1,678** total participants in Years 1-3
  - **1,219** (73%) identified as undergraduates
  - **135** (8%) graduate students
  - **223** (13%) staff
  - **99** (6%) faculty or administration

### Behaviors and Pain
- No Leisure Time PA
- Poor Sleep
- Shoulder/Neck Pain
- Low Back Pain

### Reported Mental Health Symptoms
- Depressive Symptoms
- Anxiety Symptoms
- Stress Symptoms
Surveyed Sept - Nov 2019
- 76.8% female
- 2,060 participants
- 242 (12%) students
- 1,425 (69%) staff
- 361 (18%) faculty

Health Behaviors reported by UAMS students, staff, and faculty

- ↑ physical activity → ↓ odds of high BP, high cholesterol, diabetes, and pain
- ↑ sleep → ↓ odds of high BP, high cholesterol, heart problems, diabetes, asthma, and pain
- Leisure physical activity & ↑ sleep → ↓ depressive, anxiety and stress symptom scores
- Leisure physical activity & ↑ sleep → ↓ work-related burnout

Howie EK et al, Manuscript under review

Fitness Assessments (n=170, 63% female)

Body Composition | Muscular Strength | Flexibility | Muscular Endurance | Aerobic Fitness

% BF Females: 38.3%  
% BF Males: 21.7%  
Females >35%BF: 64%  
Males >25%BF: 35%

40% (n=67)  
37% (n=61)  
28% (n=47)  
42% (n=74)

Percent classified as Poor or Very Poor for age and sex

Daniels BT et al, Manuscript in preparation
In general...

- Good
- Not so good

Honors Student Projects

Exercise Is Medicine

- Caroline Goehrke (May 2021): The Health Benefits of Sleep and Physical Activity
- Arison Gray (May 2021): The Health Benefits of Sleep and Physical Activity
- Lindsey Herber (May 2021): The Health Benefits of Sleep and Physical Activity
- Zachary Parisi (May 2021): How the physical performance of athletes and staff and to examine the relationship between physical performance and stress levels
- Jared Collier (May 2020): Sleep Duration and Physical Performance in College Students
- Trey Dail (May 2020): Effects of Sleep on Physical Performance
- Rebecca Eberle (May 2020): The Health Benefits of Sleep and Physical Activity
- Sarah Schwartz (May 2020): An Analysis of Physical Performance
- Lindsay Spitalotto (May 2020): Health Benefits of Sleep and Physical Activity
- Jordan Means (Dec 2019): Does the Amount of Sleep Affect Physical Performance?
- Lauren Deems (May 2019): Recruiters’ Perceptions of Physical Activity
- Makayla Goggins (May 2019): Assessing Risk Factors for Physical Activity

https://exerciseismedicine.uark.edu/research/undergrad-research/
How has COVID-19 affected physical activity?

Physical Activity during COVID-19

- First 1,000 responses
- Respondents from:
  - Asia (36%)
  - Africa (40%)
  - Europe (21%)
  - Other (3%)

Physical Activity & Health During COVID-19

- **Mental health** - Decreases in PA associated with higher depression, anxiety, and stress symptoms in Australia (Stanton et al. 2020)
- **Cardiovascular risk** – Even short-term decreases in PA can increase cardiovascular risk (Pecanha et al. 2020)
- **Diabetes** – Individuals with diabetes at greater risk for poor outcomes from COVID-19, and COVID-19 contributes to worse diabetes outcomes (Hartman-Boyce et al. 2020)
- **Immune function** - Physical activity can improve immune function (Sallis 2020)

COVID-19 Behavior Research

- Relies on self-reported behaviors
- Uses retrospective recall of pre-COVID-19 behaviors

*Exercise is Medicine cohort provides a unique opportunity to study these relationships*
Provost Collaborative Project
Jamie Baum, Ivan Vargas, Samantha Robinson

- Survey
  - Physical Activity: International Physical Activity Questionnaire-Long Form (IPAQ)
  - Sleep: Pittsburgh Sleep Quality Index (PSQI)
  - Nutrition: diet behaviors
  - Mental health: happiness, DASS-21
  - COVID-related questions eg. social isolation, perceived changes in behaviors due to COVID
- Accelerometers – physical activity & sleep
- 24-hour Diet recall
- mEMA cognitive assessments

mEMA Cognitive Assessment

Brain Games: Multiple Object Tracking Instructions
- 5 green dots will flash green briefly on the screen and then return to grey
- To the best of your abilities, keep track of those 5 dots as they scatter across the screen

Brain Games: Go No-Go Examples
- Remember to only tap the button when you see a letter that is NOT X
Preliminary Exploratory Results

Behavioral Changes

Physical Activity

IPAQ - Total MET Minutes

• Before
  • M = 3043.37, SD = 3394.19
• After
  • M = 4281.17, SD = 4758.28
  • t(34) = 2.76, p = .01, d = 0.47

Covid-19 Question

• How has PA changed?
  • 42% reported PA ‘decreased a lot’
  • 55% reported PA decreased ‘a lot’ or ‘a little’

What about different types of physical activity?

• 38 participants: 23 faculty/staff, 8 graduate students, 7 undergraduate students

• Questionnaire comprised of:
  • International Physical Activity Questionnaire (IPAQ)
  • Pittsburgh Sleep Quality Instrument
  • Depression, Anxiety, and Stress Scale-21 (DASS-21)
  • Perceived changes in behaviors
Preliminary Exploratory Results

Behavioral Changes

Sleep

PSQI
- Before
  - M = 5.28, SD = 3.14
  - 47% categorized as ‘Poor’ sleepers
- After
  - M = 5.69, SD = 3.09
  - 53% categorized as ‘Poor’ sleepers
  - t(28) = 0.99, p = .33, d = 0.18

Covid-19 Question
- How has sleep changed?
  - 39% reported no change in sleep
  - 21% reported sleep improvement
  - 32% reported a worsening in sleep

Mental Health Changes

Depression
- Before
  - M = 6.80
  - SD = 8.80
- After
  - M = 10.60
  - SD = 12.08
  - t(9) = 1.99, p = .08, d = 0.63

Anxiety
- Before
  - M = 10.60
  - SD = 12.08
- After
  - M = 7.60
  - SD = 6.85
  - t(9) = -0.95, p = .37, d = 0.30

Stress
- Before
  - M = 11.80
  - SD = 9.50
- After
  - M = 11.60
  - SD = 9.08
  - t(9) = -0.14, p = .90, d = 0.04

Happiness
- Before
  - 55% felt happy ‘very often’ or ‘all of the time’
- After
  - Only 29% felt happy ‘very often’ or ‘all of the time’

21

22
Preliminary Exploratory Results

Behavioral Changes - Diet

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
</table>
| Breakfast     | 53% do not eat breakfast on weekdays  
                82% do not eat breakfast on weekends |
| Fast Food     | Nearly 8% report eating fast food 4 or more times per week  
                Approximately 40% report eating heat and serve items at least once per week |
| Fruit         | 55% eat fruit 4 or more times per week |
| Vegetables    | 71% eat vegetables 4 or more times per week |
| Protein       | 74% eat protein 4 or more times per week |
| Grains        | 45% eat grains 4 or more times per week |
| Dairy         | 55% consume dairy 4 or more times per week |
| Sweets        | 42% eat sweets 4 or more times per week |
| How Has Diet Changed? | 37% reported their diet being worse currently than it was prior to covid-19  
                            However, 21% reported improvements in their diet |

How Has Diet Changed?

Can we improve health behaviors on campus?
Razorwalk

- Quasi-experimental study
- Intervention provided social support to encourage walking 30 minutes, 5 days per week for 4 weeks
  - In-person group: walked together on campus
  - Virtual group: wore a wearable fitness tracker and communicated through a group social messaging app
- Implementation fidelity and acceptability
  - Attendance
  - Detailed records
  - Focus groups and interviews
- Primary outcomes: accelerometer-measured physical activity
- Secondary outcomes
  - Cardiorespiratory fitness, muscular strength and endurance, flexibility
  - Work-related outcomes of job satisfaction and cognitive performance

**Razorwalk In-Person**
- Vigorous & Moderate Physical Activity
- Weight (-1.9 lbs)
- NOGO Accuracy

**Razorwalk Virtual**
- Vigorous & Moderate Physical Activity*
- Weight (-2.7 lbs)
- Cardiorespiratory fitness
- NOGO Accuracy

*Virtual group only
Exercise is Medicine On Campus in Arkansas

- Continuing and expanding EIM survey & fitness assessment
- Piloting Physical Activity Vital Sign in health center

Exercise Referrals
Exercise is Medicine beyond Arkansas

- 166 universities and colleges recognized around the world
- EIM-OC Data Repository

- Incorporating the ‘Exercise is Medicine’ Knowledge, Skills and Abilities into all 4 years of the medical curriculum
- Partnering with the Greenville Health System and local YMCA's
- Partnering with the Institute of Lifestyle Medicine (ILM) at Harvard Medical School to serve as a model of exercise curriculum

CONTACT INFORMATION

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9/21/2021