Muscle Strength and Brain Health

Ryan McGrath, Ph.D., Assistant Professor, NDSU Health, Nutrition and Exercise Sciences

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Hello 😊

Background

• Assistant Professor
  – Department of Health, Nutrition, and Exercise Sciences
• Affiliate Faculty
  – Center for Large Data Research & Data Sharing in Rehabilitation
  – University of Texas Medical Branch

Research Interests

• Epidemiology of aging
• Topics related to physical activity and health across the lifespan
• Methodological improvements

Muscle Strength & Brain Health

4 = ???
Brain Boosters: Fads, Facts and Fundamentals Session Two - Brain Health & Physical Activity

Muscle Strength and Brain Health

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Muscle Strength & Brain Health

- Do you think that handgrip strength is a good proxy measure of overall strength capacity?
  - A) Yes
  - B) No
  - C) Maybe

Muscle Strength & Brain Health

- Categorical weakness
  - Men: <26-kg
  - Women: <16-kg

Muscle Strength & Brain Health

- Percentiles

Muscle Strength & Brain Health

- Relatively inexpensive
- Simple to perform
- Somewhat commonplace in the literature
- Provides rich health information

Muscle Strength & Brain Health

- Do you think that handgrip strength is a good proxy measure of overall strength capacity?
  - A) Yes
  - B) No
  - C) Maybe
Muscle Strength & Brain Health

- Lower muscle strength (as measured by handgrip strength) is more so a product of ___?
  - A) Diminished muscular system function
  - B) Diminished neural system function
  - C) Both diminished muscular and neural system functioning
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Muscle Strength & Brain Health

- What about physical activity?
- What about nutrition?
- What about morbidity?
Muscle Strength & Brain Health

- Clinically-viable screening tool
- *Powerful* biomarker of aging
- “Vital sign” of health
- Routine (geriatric) health assessments

Thank You!

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Any Questions?
Brain Boosters: Fads, Facts and Fundamentals Session Two – Brain Health and Physical Activity

Taijiquan and Cognitive Function

Matthew F. Komelski, Ph.D., Instructor, Department of Human Development
Virginia Polytechnic Institute & State University

Taijiquan & Cognitive Function

Reviewing the data

Prevalence of Practice in the US

• How many of you have ever practiced Taiji (Tai Chi)?
• 2016 report based on the NHIS (Lauche et al.)

WHAT IS TAIJIQUAN?

(aka Tai Chi Chuan)

• Systems (6+) of meditative movement practices with roots in traditional Chinese
• Meditation
• Martial arts
• Health & Healing practices (Qigong)
• Practiced worldwide to promote health, wellbeing, and optimal aging.

World Taiji Day – Last Saturday in April
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TRADITIONAL MOTIVATIONS FOR TAIJI-QIGONG PRACTICE

• Health, healing & longevity
• Regulation of mood, sleep & pain
• Strength & endurance
• Mobility & balance
• Complements other activities
• Productivity and generativity

THEORETICAL REVIEW

ACTIVE INGREDIENTS

(Chang et al. 2013)

Missing from above: Many people report a "Relaxation Response" during and after practice.

2014 REVIEW ON TAIJI AND COGNITIVE PERFORMANCE (WAYNE ET AL.)

• 20 Studies
• 11 RCTs
• 2553 Participants
• Executive Function*
• Healthy adults- Large effects
• Adults with MCI or early stage dementia- Smaller but significant effects
• Conclusion
• Tai Chi may offer a safe, nonpharmacological approach to enhancing cognitive function in older adults.

*Executive function- cognitive processes that regulate, control, and manage other cognitive processes, such as planning, working memory, attention, problem-solving, verbal reasoning, inhibition, mental flexibility, task switching, and initiation and monitoring of actions. Also important to balance and postural control.

2019 REVIEW ON MBE & COGNITIVE PERFORMANCE (ZHANG ET AL.)

• Mind Body Exercise (MBE)- Taiji, Qigong, Yoga & Pilates
• 19 RCTs with control interventions
• 2539 older participants
• Significant Improvements in
• Executive function
• Learning and memory
• Language task
• Conclusion:
• Mind-body exercise can be a safe and effective intervention for enhancing cognitive function among people aged 60 years or older.
OTHER CONSIDERATIONS

• Taiji & Qigong
• Do not require equipment
• Relatively safe - adverse events are low compared to many other forms of exercise
• Adaptable to ability level and special needs
• Forms for specific conditions
  • Aichi (aquatic Taiji)
  • Taiji Easy
  • Taiji for Arthritis
• Complement to other activities
  • Teacher/Coach makes the difference

REFERENCES