AN OSTEOPATHIC APPROACH TO MENTAL HEALTH THROUGH EXERCISE AND MOVEMENT

Stacey Pierce-Talsma DO, MS.MEd-L, FNAOME
AAO Convocation 2016, Orlando Fl.
DISCLOSURES

• The opinions offered in this presentation are of the presenters and do not represent the opinions of the American Academy of Osteopathy
• All materials and content are the intellectual property of the presenter or are cited and do not infringe on the intellectual property of any other person or entity
• The speakers do not endorse any product, service or device with this presentation
• Dr. Pierce-Talsma has no financial disclosures
OBJECTIVES & GOALS

- Describe the results of literature on the use of exercise in the treatment of depression & anxiety

- Identify physiologic and psychologic processes by which exercise and movement may affect mood

- Explore the connections of anatomy, physiology, posture and emotion

- Delineate how movement and exercise may benefit patients with mood disorders
WHY EXERCISE/MOVEMENT FOR ANXIETY & DEPRESSION?

“We should not exercise the body without the joint assistance of the mind; nor exercise the mind without the joint assistance of the body.”

~Plato
RESEARCH HAS PROVEN TO BE DIFFICULT

- Variations in diagnosis
- Variations in type of exercise
- Dose of exercise
- Different methods of assessing depressive scores
- Small sample sizes
- Source of subjects
- Exercise Location
- Variation in Age
- Health Status
- Physical activity only vs those aimed at changing multiple health behaviors
- Lack of concealment
- Incentive
• North 1990- Meta-analysis
  • Acute/Chronic exercise effective and effects may begin at the first session
  • All types of health statuses had decreased depressive scores
  • Decreased regardless of location
  • Older subjects had a greater decrease in depression
  • May only be useful with clinical depression
  • Anerobic and aerobic both effective
  • As effective as psychotherapy and added with psychotherapy greatest effect
• Lawlor 2001, Sjosten 2006, Rethorst 2009- Meta-analysis
  • Exercise may be effective but recommended further well-designed trials
  • “exercise treatment had significantly lower depression”
• Conn 2010- Meta-analysis on healthy adults
  • Reduction of depressive symptoms in healthy adults
• Bridle et al 2012- Systematic Review and Meta-Analysis of RCT
  • Exercise will reduce depression severity in patients >60
• Robertson 2012 systematic review and meta-analysis-
  • Walking may be a useful adjunct for depression treatment
  • “Exercise may have a moderate sized favorable association with depression, but because of risk of bias, this association may be small.”
  • Exercise is moderately more effective than no therapy for reducing symptoms of depression
  • Exercise is no more effective than antidepressants for reducing symptoms of depression or psychological therapies
  • Exercise is superior to bright light therapy
NEGATIVE STUDIES

• **Krogh et al 2010- Systematic Review and Meta-Analysis of RCT**
  
  **Conclusion:** (small benefit) - little evidence of a long-term beneficial effect
  
  + Clinical Diagnosed Depression, adults of all ages - 13 trials limited power

• **DEMO 2009/DEMO II 2012/TREAD 2011/TREAD-UK 2012- RCT’s**

  DEMO- aerobic exercise vs anaerobic vs relaxation (control)
  
  DEMO II- aerobic vs stretching - reduction in both groups - but no difference between groups
  
  TREAD 2011- non significant trend toward remission at 16kcal/kg/week
  
  TREAD 2012- (usual care vs usual care + intervention) exercise was ineffective and a more costly strategy
  
  FAILED to find statistically significant antidepressant effects of exercise

• **Underwood et al 2013 RCT**

  Aged 65 years or older in care homes - twice weekly exercise sessions with a physiotherapist
  
  Exercise did not reduce depressive symptoms in elderly residents of care homes
Blumenthal et al (1999, 2007)\textsuperscript{49, 41}

- 16 weeks of group exercise in older patients with MDD was as effective as Sertaline.
- At 10 months the relapse rate and rates of depression was significantly lower in the exercise group than the medication group or combination group.
- 2007 study- remission rates- supervised exercise 45%, home exercise 40%, medication 47%, placebo 31%.

Dunn 2005- RCT\textsuperscript{4}

- Public health does is an effective monotherapy for MDD.

Mota-Pereira et al (2011)\textsuperscript{26}

- Treatment resistant MDD (pharmacotherapy vs pharmacotherapy + exercise).
- None in control group had remission/ 26% remission in exercise group.
EXERCISE FOR ANXIETY

• Petrezzullo 1991, Herring 2011 Meta-analysis
  • Exercise reduces anxiety
  • “Exercise training reduces anxiety symptoms among sedentary patients who have a chronic illness”

• Broocks 1998 RCT
  • Significant improvement in panic over placebo, but less effective than clomipramine

• Cochrane review 2006 Meta-analysis
  • Ages 11-19: Small effect in favor of decreasing depression & anxiety scores

• Conn, V. 2010
  • Statistically significant improvement in anxiety outcomes in Healthy Adults

• Other studies
  • Acute exercise is anxiolytic
  • Exercise may induce panic attacks - largely disproven - Exposure Therapy
SUMMARY

Overall- Exercise is shown to improve symptoms of depression and anxiety
Exercise is better than placebo
Exercise is equal to Sertaline
Exercise is equal to psychotherapy
Exercise is superior to bright light therapy
Walking is effective for treating depression
Exercise is a good adjunctive intervention for CBT
We need more studies for better data and description of type, intensity, frequency
Physiologic Pathways by Which Exercise May Affect Mood

Monoamine Dysfunction
(Serotonin, Endorphins, Norepinephrine)

HPA Axis Dysfunction

Neuroimmune system dysfunction

Neurogenesis Dysfunction

Other Models
Psycho-social, Behavioral, Cognitive
MONOAMINES

• Increase in response to stressors and pain
  • **Opioids**
    • B-endorphin calms the sympathetic nervous system and provides analgesic relief
    • May stay elevated 2-3 days
  • **Serotonin**
    • Increases with activity (increased production)
  • **Norepinephrine and Epinephrine**
    • Increased levels with activity (increased release)
  • **Dopamine**
    • Increased levels with activity
Prolonged stress can lead to increased cortisol levels

Early life events can lead to a persistent sensitization of the HPA-axis

Dysregulation related to psychiatric disorders

Depression usually has hyperactivity of the HPA axis

Exercise leads to a physiological “toughness”
Stress and Depression Elevate:\:\:\nIL-6, CRP, NK cell function, TNF-a\nHyper-reactivity of pro-inflammatory state\nImpaired T cell function

Proinflammatory cytokines can:\:\:\nInfluence monoamine metabolism\nNeuronal genesis/survival\nDecrease HPA axis sensitivity to cortisol\nCellular neuroimmune functions

Neuroimmune modulating effects of Exercise:\:\:\nPositively influence inflammatory, oxidative, apoptotic and antineurogenic mechanisms

Physical Inactivity

Visceral Fat Accumulation

Chronic systemic Inflammation

Insulin Resistance, Atherosclerosis, Neurodegenerations, Tumor Growth

DMII, Cardiovascular disease, Depression, Dementia, Colon Cancer, Breast Cancer\(^42\)
• Exercise induced VEGF-Flk-1 Signaling
  • Depression = decreased neurogenesis in hippocampus
  • Exercise increases hippocampal neurogenesis- affects blood vessel density and plasticity of neurons

• Kyneurenine metabolism
  • Kynurenine in the brain has been implicated in brain disorders and depression
  • Exercise increases breakdown via KATs and reduces the amount that reaches the brain

• Stimulation of proteins to improve health and survival of nerve cells
  • Exercise increases Brain-derived growth neurotrophic factor (BDNF)

• B-Endorphins and Serotonin
OTHER MODELS

- **Thermogenic model**
  - EEG changes, gamma neuron motor activity changes

- **Endocannabinoid system excitation**

- **GABA**
  - Exercise postulated to decrease GABA receptors increasing GABA concentrations

- **Electrocortical changes**
  - EEG- Alpha waves increased- more in the frontal region associated with relaxation
- Social Interaction
- Changes in daily routine
- Weight loss
- Outdoor recreation
- Achievement
- Time out
- Interruption of a maladaptive cognitive set

- Exercise releases positive feelings
- Feeling successful
- Increased self-efficacy
- Increased self esteem
- Cardiovascular fitness
- Distraction from negative thoughts
- Stress Resilience
MOVING BEYOND CARDIOVASCULAR EXERCISE....MOVEMENT CAN CHANGE OUR SHAPE AND STRUCTURE
“YOU SEE I BELIEVE IN SHAPES. I BELIEVE EVERYTHING GOOD HAS A SHAPE. SHAPES ARE THE WAY IN WHICH WE KNOW WHO WE ARE AND WHERE WE ARE IN OUR UNIVERSE. SHOW ME THE SHAPES AND FORMS A MAN GIVES TO HIS LIFE, AND I WILL TELL YOU WHETHER HE IS A MASTER OR VICTIM OF THAT LIFE.”

-Gail Godwin, Glass People

Postures Become Patterns
Can our anatomy change the shape of our emotions?
“Anatomical studies tend to depict images that are two dimensional, thus missing the most important element, emotional life. At the same time, psychology, which is committed to the study of emotion, lacks an anatomical understanding. Without anatomy, emotions do not exist.”

~Stanley Keleman
“Life make shapes. These shapes are part of an organizing process that embodies emotions, thoughts, and experiences into a structure”,

“Shape is imprinted by the challenges and stresses of existence”,

“Structure is slowed down Process”

Dr. Stanley Keleman
“Emotional Anatomy”
“The internal connection of all layers gives rise to tissue consciousness, the sum of sensations from all levels of cells in a pattern of trillions of surfaces and internal environments. This gives birth to individual self-awareness”
TENSEGRITY

- Compression and Tension
- Dynamic Element?
- Emotional Releases?
- Observing our patients emotional posture
“a person’s physical postures are not just “windows” or passive indicators into emotion; instead, postures are behaviors with stimulus properties (social and proprioceptive) that can have a self-regulatory role as they affect the person’s own self-perceptions and actions.”
"Sometimes your joy is the source of your smile, but sometimes your smile can be the source of your joy"

~ Thich Nhat Hanh

- **ATTITUDE** - Miriam Webster
  “The Arrangement of the parts of a body or figure: Posture”

- **Slumped Vs. Upright Posture**
  - Effect on Confidence, metacognition
  - Posture can affect direction of thoughts
  - Slumped - lower self esteem and mood and greater fear
  - Influences Productivity
  - Influences Memory
  - Upward head tilting & Posture increased pride
  - Poor posture can leave you vulnerable to crime
  - Slumped posture led to helplessness & lack of persistence
  - Movement in a “yes” pattern produced increased preferences
“While many of us spend hours every day using small mobile devices to increase our productivity and efficiency, interacting with these objects, even for short periods of time might do just the opposite, reducing our assertiveness and undermining our productivity.”

“Sitting upright may be a simple behavioral strategy to help build resilience to stress”

How much is our sitting- our lack of movement- our lack of a full range of physical experience affecting our physical being, and our emotional being
POWER POSES

- Amy Cuddy-Ted Talk
- Expression of power through open expansive postures
- Powerlessness through closed contractive postures
- High Power Poses
  - Increase in Testosterone
  - Decrease in Cortisol
- “Displays of power caused advantaged and adaptive psychological, physiological, and behavioral changes, and these findings suggest that embodiment extends beyond mere thinking and feeling to physiology and subsequent behavioral changes.”

38
TYPES OF MOVEMENT

Zumba
Tai Chi
Yoga
Pilates
Dance
Belly Dance
Aerobics
Gyrokinesis
Martial Arts
Dance Therapy

http://www.adta.org/About_DMT/
American Dance Therapy Association
“EXPANSION AND CONTRACTION ARE THE ESSENTIAL PUMPS OF EXISTENCE”

• Autonomic nervous system
  • Engagement of Breath
  • Physiologic postures
  • Flexibility of the Autonomic nervous system
  • Savasana - parasympathetic effects

• Release of muscle tension and Mind chatter
  • Brings attention to the here and now
  • Stress can activate the limbic system causing muscular tension

• Ayurvedic perspective
  • Solar plexus
FORWARD FOLDS

• Cooling
• Introverted
• Introspective
• Protective
• Create length and space in the spine
• Humility, surrender, letting go
• Activate the 2\textsuperscript{nd} Chakra
• Excitatory

• Extroverted

• Opening

• Open and exposed fears

• New perspectives
GROUNDING

- Redirects energy
- Stability
- Connection
- Support
- Foundation
- Used for all other elements of motion
• Core engagement
• New perspectives
• Upending relationship with gravity
• Focus
• Confidence
• Autonomic changes
• Releases ego
BALANCING

• Mental discipline

• Strength, flexibility, proprioception

• Working through anxiety

• Dealing with falling
RESEARCH ON YOGA AND MOOD

• **Kirkwood 2005**\(^{55}\) *Yoga for Anxiety- A systematic review*
  - 8 studies, all positive results, methodological issues, no recommendation possible

• **Cramer 2013**\(^{66}\) *Yoga for Depression: A systematic Review and Meta-Analysis*
  - 12 studies, methodological drawbacks, yoga can be an ancillary treatment option

OTHER

• Improvement in mood, Decreased anxiety, Increase in GABA levels\(^{35}\)
• Yoga improved mood immediately after the sessions in 113 psychiatric inpatients
• Yoga improved mood and increased morning cortisol in 28 young adults who practiced a 5 week Iyengar yoga class
FINAL THOUGHTS

How to prescribe exercise and address barriers to use
DOSE RESPONSE AND SAFETY

• The DOSE Study
  • “Public health dose (PHD) of exercise is an effective monotherapy for mild to moderate MDD”
    • Scores reduced by 47%
    • This is comparable to CBT and medication (36% and 42% respectively)
    • 17.5 kcal/kg/week divided by 3 days = Public Health Dose
  • No Difference 3 day a week vs 5 day a week
    • >30 minutes of moderate intensity on most days of the week

• Anxiety meta-analysis
  • High and moderate intensity better than low intensity
  • No difference in weekly or total dose of physical activity
  • Supervised physical activity

• Supervised physical activity
  • Very little research on the type, frequency, duration, supervised or unsupervised

• Cooney et al. Exercise for Depression
  • Only 7 trails reported adverse events
  • None reported an increase in adverse events associated with exercise

• “UK National Institute for Health and Clinical Excellence recommends structured exercise 3 times a week for 10-14 weeks for the treatment of mild to moderate depression”
**Barriers to Exercise**

**Barriers**
- Low motivation
- Lack of ability or confidence
- Lethargy and fatigue from depression
- Fear - anxiety, BMI, body physique awareness

**Positives**
- Most viewed exercise as an acceptable treatment
- Sense of purpose
- Autonomy
- Long term treatment without “dependence”

**Combatted by**
- Medications to help improve movement
- Activity Diary
- Motivational messaged- printed or by computer
- Time of day
- Use of motivational interviewing
- Flexibility in exercise strategy
- Social support
- Behavioral Techniques
A SPECIAL THANKS TO ALL MY BEAUTIFUL FRIENDS IN MOVEMENT!!

Amelia Bueche DO
“This Osteopathic Life”, -Ashland Oregon
MamaTriDoc

Leanna Garbus OMS V
Yogi Extraordinaire!

Anecia Trickey & her beautiful daughter
Sophia
RYT yoga teacher

Alexandra Peters
yoga teacher extrodinarire

Sean Eshraghi
Weight lifter – motivator!!- Beast Mode!!

[The] processes of Life must be kept in motion.
A.T. Still
—Philosophy of Osteopathy


25. Dunn, A. et al. The DOSE study: a clinical trial to examine efficacy and dose response of exercise as treatment for depression. Controlled Clinical Trials 2002; 23:584-603


30. Daley, A. Jolly, K. Exercise to treat depression does not seem to benefit patients in clinical settings who receive good standard of care. BMJ editorial 2012;344:e3181 (June 6, 2012)


32. Keleman, S. Patterns of distress emotional insults and human form. 1989


46. Picture- Slide 10 http://chrissyandlindsey.wikispaces.com/Chapter+4+-+Nervous+System%3B+Neurons+and+Synapses


