2007 MIND-BODY RESEARCH UPDATE: FROM A TO ZEN

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Special thanks to: Len Kravitz, Ph.D.

EXPLORING RESEARCH….

- INTRODUCTION AND PURPOSE
- BACKGROUND REVIEW ON MIND-BODY: S. & D.
- INCLUDE BREATHING, MUSIC, & DISCIPLINES
- RESEARCH REVIEW STANDARDS
- RESEARCH PRACTICUM
- CONCLUSIONS

Let’s Establish the Mind-Body Connection From Research

Study of Depression Clearly Shows The Mind and Body Are ‘Linked’ into a Single System.

The Mind-Body Connection

Depression: The Mind Can Affect the Body

The Body Can Affect the Mind

The Facts: Clinical Depression

- Symptoms
  - Sadness, sleep problems, inability to feel pleasure
- Treatment (clinical)
  - Antidepressants, medications, psychotherapy, stress reduction
- Prognosis
  - Comes/goes in cycles: controllable if treated
- People affected in U.S.: 20 million

Time Magazine, Jan. 20, 2003
The Mind-Body Connection

- Positive mental states = physical well-being
- Unhealthy body = Unhealthy mind
- Illness in mind may trigger illness of body
- Mind and body: “part of single system”
- Brain chemistry affects body physiology
- The mechanism: inspiring clues
  - Neurotransmitters
  - C-reactive protein (CRP)
  - Cortisol

Depression
An Independent risk factor for CAD!

Daily Experiences → Neurotransmitters Released → Toxic To Body

Time magazine, Jan. 20, 2003

Prof. Dwight Evans (2003) University of Pennsylvania

Disease-Depression Connection

- Cancer
- Diabetes
- Epilepsy
- Heart disease
- Osteoporosis

Stress

Like its more severe cousin “depression,” stress can be harmful to the body!

Time magazine, Jan. 20, 2003

Prof. Dwight Evans (2003) University of Pennsylvania

Stress: Harmful to Mind & Body

- Acute
  - Response to “imminent threat”
  - Flood of hormones: affects CV system
- Chronic
  - Constant ‘uncontrollable’ pressure
  - Hormones weaken immune system; damage bones
  - Americans spend $27 billion dollars/yr on alternative medicine options

Fight-or-Flight

Body Unleashes a Flood of Hormones!
Useful in the short-term
Become Toxic if Persist

Enter Stress Reduction Strategies:
Yoga, Meditation, T’ai Chi

Has Not Changed for Thousands of Years!
Stop! How Do You Explain to Your Clients How Mind/Body Exercises Combat Stress and Depression?

“Mind/Body exercise appears to act as a buffer in many stress-illness relationships, through biochemical interactions linking mind and body.”


Stop! How Do You Explain to Your Clients How Mind/Body Exercises Combat Stress and Depression?

Complimentary and Alternative Medicine Program (CAMPS) at Stanford

Hypothalamic/Pituitary/Adrenal (HPA):
- Receptors of stress, but m-b practice reduces:
  - H: activation of HPA
  - P: arousal and hypervigilence
  - A: catecholamine and cortisol production in adrenal

Stop! And What Can Be Manipulated?

Proven Therapy for:

- Musculoskeletal disorders including MD, MS
- Type II diabetes
- Eating Disorders, Weight Control
- HIV, AIDS, and related treatment
- Menopause
- Cancer symptoms
- Anger and Stress Management
- Sleep, Stress, Anxiety, Depression disorders
- Migraines
- Stress-related cardiac dysrhythmias
- Cardiac, pulmonary rehabilitation


The Power of Yoga

- “Union between mind and body”
- Dates back 5,000 years
- 15 million Americans do yoga regularly
- 75% of U.S. health clubs offer yoga classes
- Eastern tradition meets Western lifestyle
- Life forces & energy centers from within
- View the body: inside out vs. outside in
- Holistic versus parts
  - Integration of body, mind, and breath

Yoga

Why Does Yoga Work?
Overview: Why Yoga Works

- Autonomic nervous system basics
  - Sympathetic nervous system (SNS)
  - Parasympathetic nervous system (PNS)
- Yoga: deep breathing, stretching, contracting & relaxing muscles, focus on ‘presence in body’

Yoga turns the Fight-or-Flight off (SNS)
Yoga turns the Relaxation Response on (PNS)

- Body enhances healing mechanisms

Is Yoga a Natural Health System?

- Most cited study: Ornish 1990
  - 94 patients with coronary heart disease
  - 53 patients prescribed yoga, group support and vegetarian diet (10% fat)
  - Cholesterol decrease similar to drug intervention
  - After 1 year: significant regression of atherosclerosis
  - Control: significant progression of disease

Is Yoga a Natural Health System? (cont)

- Ornish, 1998; American Journal of Cardiology
  - 194 patients in experimental group (coronary heart disease)
  - Main Result: 80% avoided bypass or angioplasty
  - Lifestyle changes of patients included yoga
  - Ornish: “adherence to the yoga and meditation program was as strongly correlated with the changes in the amount of blockage as was the adherence to diet”

Yoga and Health-Related Fitness

- Impact Research
Effects of Hatha Yoga Practice on Health-Related Aspects of Physical Fitness
Tran et al., Preventative Cardiology, Vol. 4, 165-170, 2001
- 10 subjects, 18-27 yr
- 2 yoga classes/wk for 8 weeks
- Class: 10 min pranayama, 15 min warm-up, 50 min of asanas, 10 min supine relaxation
- Strength: elbow extension (+31%), elbow flexion (+19%), knee extension (+28%)
- Flexibility: ankle (+13%), shoulder elevation (+155%), trunk extension (+188%), trunk flexion (+14%)
- Aerobic capacity: +6-7%

Yoga and Hypertension
- 33 hypertensive (mild-moderate) subjects 35-65 yrs
- Yoga group, medical treatment group, control group
- Yoga in morning and evening (1 hr/session), 11 weeks
- Medical treatment group on anti-hypertensive drugs
- Results
  - Yoga more effective than drugs

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<thead>
<tr>
<th></th>
<th>Yoga</th>
<th>Drugs</th>
<th>Control</th>
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<tbody>
<tr>
<td>Pretest (DBP)</td>
<td>108 mmHg</td>
<td>106 mmHg</td>
<td>109 mmHg</td>
</tr>
<tr>
<td>Posttest (DBP)</td>
<td>82 mmHg</td>
<td>96 mmHg</td>
<td>107 mmHg</td>
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Beneficial effects of yoga lifestyle on reversibility of ischemic heart disease: Project Care of International Board of Yoga
Yogendra J et. al. J Assoc of Physicians India; 52:283, The Yoga Institute, Mumbai, 2004
- 71 patients with CAD (29 yoga and 42 control)
- Yoga based lifestyle modifications of 8 limbs
- Heart imaging and angiographic studies
- Main Results: LDL decreased 26% vs 2.4% in control
- Heart imaging showed 44% improvement vs 31% in controls
- Angiographies: CHD progression: 30% of study group vs 60% of control

Aerobic capacity and perceived exertion after yoga practice
Ray, U, et. al., Indian J Medical Registry 114, December, 215-221, New Delhi, 2001
- 40 men from Indian army (18-25y/o) given intense VO2max testing w/perceived exertion
- 29 yoga group and 20 conventional exercise
- Main Results: yoga group had greater PE drop after intense exercise than control
- Conclusions?
Yoga and NIDDM

A Study of Response Pattern of Non-Insulin Dependent Diabetics to Yoga Therapy
Jain et al., Diabetes Research and Clinical Practice, Vol. 19, 69-74, 1993
- 149 NIDDM subjects (very large study)
- Yoga 1.5 hr in morning and 1 hr in evening: shatkriyas, asanas, pranayama
- 40 consecutive days treatment
- Results
  - NIDDM patients with disease less than 10 yr & fasting glucose levels of 140 mg/dl could be controlled by yoga alone

Yoga and Epilepsy

Yoga and Epilepsy
- 1 year study
- 20 male, 20 female (avg age 27 y/o) w/epilepsy
- 2 x daily yoga meditation of 27 minutes
- Control group consisted of 2 other therapies
- Main results: in first 3 months, 39 subjects decreased seizures by 53%
- Patients who continued meditating after 3 months improved better than either drug intervention or vagus nerve stimulation techniques

Special Comment: Breathing

“Breathing patterns have an important effect on physiological and psychological functioning.”

Pranayama: ujjayi

- Inhalation phase: stretch receptors in pulmonary tissue stimulate parasympathetic system via vagus nerve
- Exhalation phase: further enhancement of inhibitory tone and PNS
- Self-study: spirometers
What About T'ai Chi Ch’uan?

12-Month T’ai Chi Training in the Elderly: Its Effect on Health Fitness

Qi Gong and Depression

Qi Gong and Diabetes

The Effect of Tai Chi on Cardiorespiratory Function in Patients with Coronary Artery Bypass Surgery

Self-efficacy as mediator of fear of falling in an exercise intervention for older adults

Qi Gong and Diabetes

Doctors hypothesize that practice stimulates neuroendocrine and immune systems.
Qi Gong and Hypertension

**International Journal of Neuroscience**: 114 [7], 777–86, 2004

- 36 hypertensive men and women
- Half in Qi Gong and half Control
- 8 week study of 60 mins daily practice or slow walking
- Main results:
  - Qi gong group significantly reduced blood pressure and LDL levels (18% or better)
  - Control group: slight improvement (3-4%)

Qi Gong and Hypertension

**Journal of Human Hypertension** [May 19], 1–8, 2005

- 88 Hong Kong subjects
- 15 week period
- Qi Gong or Conventional Callisthenic exercise
- 2 2-hour Qi Gong practices/week for 4 weeks to learn, then last 12 weeks alone daily for 75 minutes
- Both groups received instruction including relaxation techniques. Conventional exercise included: walking, and stepping daily for 75 minutes
- Main results:
  - Heart rate, bmi, body mass, circumference benefits were comparable in both groups
  - Summary: Qi Gong is a reasonable alternative to conventional Western exercise, with documented equivalent benefits.

What About Pilates Research

Research Findings From
Michele Olson, Ph.D., Auburn University

- Determined the metabolic/caloric cost of three 40 minute Mat routines:
  - Basic/Beginner Pilates Mat Workout
  - Intermediate Pilates Mat Workout
  - Advanced Pilates Mat Workout
Methods

1) Had 12 Subjects
2) Performed B, I, A in Random Order
3) Workouts Pre-Video Recorded
4) Used Oxygen/Metabolic Chart
   (1 L O₂ = 5 Kcal)
5) Monitored HR and RPE

Metabolic Tests

Conclusions

* Basic/Beginner
  4.0 Kcal per minute
  160 Kcal in 40 min

Intensity Classification
Low-Mod Intensity
Calisthenics Class / Dynamic Stretching

** Intermediate
  6.0 Kcal per minute
  240 Kcal in 40 min

Intensity Classification
Moderate Intensity
Low-Impact Dance Ex / Hatha Yoga

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  4.0 Kcal per minute
  160 Kcal in 40 min

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Intensity Classification
Moderate Intensity
Low-Impact Dance Ex / Hatha Yoga

* CDC - 150 kcal/day most days of the week reduces health risks
** 30 min = 180 kcal 45 min = 270 kcal 60 min = 360 kcal
Conclusions

Basic/Beginner
- 4.0 Kcal per minute
- 160 Kcal in 40 min
Intermediate
- 6.0 Kcal per minute
- 240 Kcal in 40 min
Advanced
- 7.5 Kcal per minute
- 300 Kcal in 40 min

Intensity Classification

Low-Mod Intensity
- Calisthenics Class / Dynamic Stretching

Moderate Intensity
- Low-Impact Dance Ex / Hatha Yoga

Mod-High Intensity
- Core Board / Power Yoga

CDC - 150 kcal/day most days of the week reduces health risks

**30 min = 140 kcal 45 min = 270 kcal 60 min = 360 kcal

PILATES FOR LOW-BACK DISORDERS

- Study recognized by the National Institute of Neurological Disorders and Strokes
- 50 participants
- 4 week study
- Main Results:
  - Study members who practiced Pilates experienced more relief from their symptoms than those who went through typical treatment programs (drug intervention, lower back care)
  - Control group: No change in symptoms

Any Research on the Therapeutic Potential of Music?

The Research Indicates Consistent Positive Effects on Physiological and Psychological States

Music appears to contribute to healing through its power to stimulate, calm, soothe and inspire bp, cort, rhr

?? What are the BEST Music Forms For Specific Therapeutic Interventions??

The Research Indicates Consistent Positive Effects on Physiological and Psychological States

Music appears to contribute to healing through its power to stimulate, calm, soothe and inspire bp, cort, rhr

Comparative Sample

HATHA YOGA
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<th>HR BPM</th>
<th>VO2 M</th>
<th>RPE</th>
<th>Kcal/Min</th>
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<td>115</td>
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Procari and Spilde, ACE F Matters, 2005
ARE YOU HAPPY?

Research Summary
There is substantial evidence that hypertension, insulin resistance, pain, cardiovascular disease, depression, stress, and anxiety respond favorably to regular participation in Mindful exercise! Core benefits from these programs include improved balance, strength and flexibility.

6 Tried and True Tips

1. Stress & Breathing:
   - Yoga: A. Ujjayi, B. Bhastrika (front, abduct, adduct)
   - Tai Chi: A. Purled Lip Breathing
   - Pilates: “forced expiration”

2. Yoga and Strength: Utkanasana

3. Yoga and Flexibility: Ardha Uttanasana

4. Tai Chi and Cardiovascular: “Sinking th Chi”

5. Tai Chi and Strength: “Rooster Stands on One Leg”

6. Pilates and Lower Back Strength: “Standing Leg Circles”

EXPLORING RESEARCH…

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RESEARCH REVIEW
RESEARCH PRACTICUM
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Take-Home Message:

Homework: