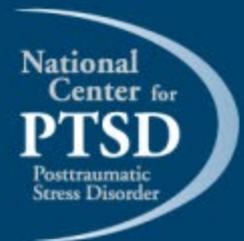


Tai Chi for Veterans: Review of Evidence and Future Directions

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Today's Talk

- Define “Active Mind-Body treatments”
- Review of Mind-Body RCTs for PTSD
- Why Tai Chi?
- Our VA Tai Chi trials
 - Feasibility study for PTSD
 - Current RCT for Gulf War Illness

Poll Question #1

- What is your primary role in VA?
 - clinician
 - researcher
 - student, trainee, or fellow
 - administrator, manager, or policy-maker
 - other

Definition of “Active” Treatments

- Individuals take active rather than passive role
 - Individuals *do* something, rather than have something *done to them*
- Often delivered in groups
- Can practice on own (outside clinic)

Examples of “Active” Mind-Body Treatments

- Yoga*
- Chiropractic and osteopathic manipulation
- Meditation*
- Massage therapy
- Acupuncture
- Relaxation techniques*
- Tai Chi*
- Healing touch
- Hypnotherapy
- Movement therapies (Feldenkrais, Alexander, Pilates)*

“Active” Mind-Body Treatments

- Encourage sense of personal agency
- No one-on-one requirement
 - Cost-effective
- Individuals can practice on their own
 - Can augment or continue beyond formal class
- No need for highly specialized equipment
- Highly “portable” with greater potential for dissemination

Poll Question #2

- Have you worked with Veterans with PTSD?
 - Yes
 - No
- If yes,
 - Research
 - Clinical – as part of caseload
 - Clinical – specialized clinic (PCT)

Focus on PTSD

- What is PTSD?
 - a) Exposure to a traumatic event
 - b) Intrusive symptoms (memories, dreams, flashbacks)
 - c) Avoidance (memories, reminders)
 - d) Negative alterations in cognition and mood
 - e) Arousal and reactivity (irritability, recklessness, exaggerated startle, poor concentration, sleep disturbance)

Prevalence of PTSD

- Lifetime risk of PTSD in US: 8.7% (Kessler et al., 2005).
- OEF/OIF/OND combat Veterans: 23.1% (Fulton et al., 2015).
- In Veterans seeking VA treatment: 23% (VHA Office of Public Health and Environmental Hazards, 2009)

Psychosocial Problems Associated with PTSD

- **Poor family relationships** (Riggs, Byrne, Weathers, & Litz, 1998)
- **Unemployment and income disparities** (Sanderson, & Andrews, 2006)
- **Suicidal ideation** (Jakupcak et al., 2009)

Increased Risk of Health Problems Associated with PTSD

- **Cardiovascular disease** (Coughlin, 2011)
- **Stroke** (Dobie et al., 2004; Spitzer et al., 2009)
- **Metabolic syndrome** (Wolf et al., 2016)
- **Chronic pain** (Shipherd et al., 2007)
- **Ovarian cancer** (Roberts et al., 2019)
- **Poor health behaviors**
 - **smoking, diet, lack of exercise** (Schnurr et al., 2000; van den Berk-Clark et al., 2018)

PTSD Affects the Whole Body

- Recent research into the neurobiological correlates of PTSD indicate that the *aging process is accelerated* for individuals with PTSD (O'Donovan et al., 2011; Tyrka et al., 2010; Wolf et al., 2019)
- PTSD is a *systemic disorder* (McFarlane, 2017)

Reasons Mind-Body Treatments Should be Used for PTSD

1. They are popular
2. Current treatments have limited reach and effectiveness
3. They target arousal
4. PTSD is a systemic disorder

Why Mind-Body for PTSD?

1. These treatments are popular and are currently utilized

- 20% of diagnosed patients with PTSD use mind-body treatments to address PTSD (Bystritsky et al., 2012)
- 39% of VA patients with PTSD utilize integrative treatments to address their emotional and mental health problems (Libby, Pilver, & Desai, 2013)
- 90% of specialized PTSD treatment programs in the VA offer mind-body treatments (Libby, Pilver, & Desai, 2012)

Why Mind-Body for PTSD?

- ## 2. Limitations of recommended EBTs
- Up to 50% of individuals with PTSD drop out of standard evidence-based treatments for PTSD
 - Or are not substantially helped by them
 - Many avoid mental health clinics due to stigma

(Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008; Steenkamp, Litz, et al., 2015)

Why Mind-Body for PTSD?

3. Meditative components address arousal

- Arousal/reactivity is one of the 4 symptom clusters of PTSD
 - Irritability, reckless behavior, hypervigilance, exaggerated startle, poor concentration, sleep disturbance
- Research shows that arousal symptoms “drive” the disorder

Why Mind-Body for PTSD?

4. PTSD affects both Mind and Body

- PTSD is now considered to be a systemic disorder associated with
 - metabolic syndrome
 - reduced cortical thickness
 - premature aging
- Metabolic syndrome is not usually considered in treating PTSD and is "ripe for intervention."
- Clinicians need to expand repertoire of treatments for PTSD to target sleep, diet, and exercise.

Erika J. Wolf et al. (2016)
Accelerated DNA methylation age: Associations with PTSD and neural integrity, *Psychoneuroendocrinology*. DOI:
10.1016/j.psyneuen.2015.09.020

Mind-body treatments treat the *whole person*

- Psychological health – Mind
 - Decrease symptoms
 - Improve sense of wellbeing
- Physical health - Body
 - Chronic pain
 - Sleep
 - Flexibility
 - Balance
 - Strength

Review of RCTs of Active Mind-Body Treatments for PTSD

- Focus on:
 - Meditation
 - Yoga
 - Relaxation
 - Tai Chi

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WILEY

RESEARCH ARTICLE

A systematic review of randomized trials of mind-body interventions for PTSD

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Abstract

Objective To systematically review outcomes from randomized controlled trials (RCTs) of mind-body treatments for PTSD.

Methods Inclusion criteria based on guidelines for assessing risk of bias were used to evaluate articles identified through electronic literature searches.

Results Twenty-two RCTs met inclusion standards. In most of the nine mindfulness and six yoga studies, significant between-group effects were found indicating moderate to large effect size advantages for these treatments. In all seven relaxation RCTs, relaxation was used as a control condition and five studies reported significant between-group differences on relevant PTSD outcomes in favor of the target treatments. However, there were large within-group symptom improvements in the relaxation condition for the majority of studies.

Conclusions Although many studies are limited by methodologic weaknesses, recent studies have increased rigor and, in aggregate, the results from mind-body treatments are promising. Despite

Review of RCTs Mind-Body for PTSD

- Aim: Summarize findings of published studies of mind-body treatment that address PTSD symptoms
 - limit to Randomized Clinical Trials (RCTs)

Review Results

- 602 publications identified
- 20 articles fit the inclusion criteria (RCT)
 - 8 Mindfulness/Meditation
 - 7 Relaxation
 - 5 Yoga
 - 0 Tai Chi
- 4 New studies added since 2017 review
 - 3 Mindfulness/Meditation
 - 1 Relaxation

Mindfulness and Meditation



Mindfulness Studies

- Bormann et al. (2008; 2013; 2018) Mantram repetition vs. waitlist, treatment as usual, present-centered therapy
- Bremner et al. (2017) MBSR vs. present-centered group
- Davis et al. (2018). MBSR vs. present-centered group
- Kearney et al. (2013). MBSR vs. waitlist
- Kelly & Garland (2016) Trauma informed MBSR
- Kim et al. (2013). Mindfulness-based stretching and deep breathing exercise
- Nidich et al. (2018). Transcendental Meditation vs. PE
- Niles et al. (2012). Mindfulness (MBSR-style) vs psychoeducation
- Polusny et al. (2015). MBSR vs present-centered group.

Yoga





Yoga Trials

- Carter et al. (2013). Multi-component yoga breath program *Journal of Traumatic Stress Disorders and Treatment*
- Mitchell et al. (2014). Yoga in women. *Journal of Traumatic Stress*
- Seppälä et al. (2014). Breathing-based meditation. *Journal of Traumatic Stress*
- Jindani et al. (2015). Yoga for PTSD preliminary trial. *Evidence-Based Complementary and Alternative Medicine*
- van der Kolk (2014). Yoga as an adjunctive treatment *Journal of Clinical Psychiatry*

Relaxation



Relaxation Trials

- Carletto et al. (2016) For MS patients EMDR vs. relaxation
- Hinton et al. (2011). CA-CBT vs applied muscle relaxation.
- Marks et al. (1998). Exposure and/or cognitive restructuring vs. relaxation.
- Markowitz et al. (2015). IPT, exposure, and relaxation.
- Taylor et al. (2003). Exposure, EMDR, and relaxation.
- **Thorp et al. (2019) PE vs. relaxation.**
- Vaughan et al. (1994). EMDR, image habituation training, and muscle relaxation.
- Zucker et al. (2009). Relaxation and heart rate variability.

Review Conclusions

- Mind-body interventions may be more appealing and confer fewer stigmas than traditional treatments.
- They promote physical health *and* relieve psychological symptoms.
- They are feasible and acceptable in Veteran populations.
- The effect sizes rival those of conventional treatments.

Future Directions

- Need more rigorous research with adequate sample sizes.
- Need to establish the ideal dose of treatment required for meaningful changes.
- Research examining these treatments in conjunction with current empirically supported treatments for PTSD is needed.
- Future trials should explore using tai chi for PTSD symptoms and comorbid problems.

Tai Chi for PTSD

- Currently no RCTs
- Very little treatment research at all

Poll Question #3

- # 2: Have you ever tried Tai Chi?
 - Yes
 - No
- # 3: If yes,
 - Once or a few times
 - Several times (8-session class or more)
 - I practiced regularly for a few months or more
 - I currently practice Tai Chi regularly
 - I teach Tai Chi or am pursuing teacher training

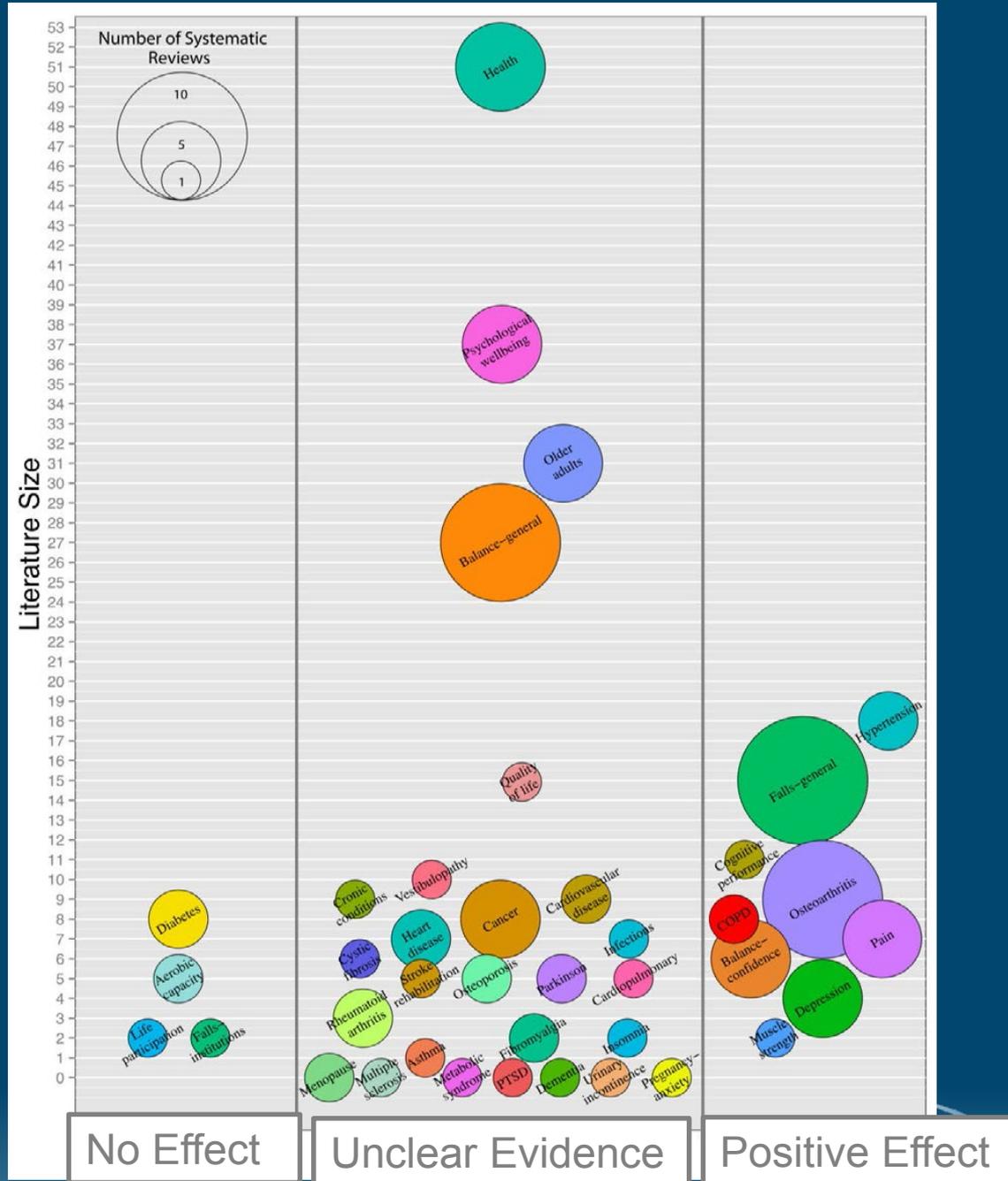
What is Tai Chi?

- Form of martial arts involving various motion routines
- Incorporates mindfulness, breathing, active relaxation, and characteristic slow movement
- Accessible for individuals of all physical health and fitness levels
- Although associated with physiological and psychological benefits, often overlooked as an intervention for psychological conditions



Tai Chi Evidence Map VA QUERI Report 2014

- Accumulating Research, but
 - Small studies
 - Non-randomized
 - Lack of control groups
- Most promising results for
 - Hypertension
 - Fall prevention
 - Cognitive performance
- Encouraging preliminary findings for
 - Osteoarthritis
 - COPD
 - Pain
 - Balance confidence
 - Depression
 - Muscle strength
- Need high quality research



ORIGINAL ARTICLE

A Randomized Trial of Tai Chi for Fibromyalgia

Chenchen Wang, M.D., M.P.H., Christopher H. Schmid, Ph.D., Ramel Rones, MD, Robert Kalish, M.D., Janeth Yin, M.D., Don L. Goldenberg, M.D., Yoojin Lee, M.S., and Timothy McAlindon, M.D., M.P.H.



Effect of tai chi versus aerobic exercise for fibromyalgia: a comparative effectiveness randomized controlled trial

Chenchen Wang,¹ Christopher H Schmid,² Roger A Fielding,³ William F Harvey,⁴ Lori Lyn Price,⁴ Jeffrey B Driban,¹ Robert Kalish,⁵ Ramel Rones,⁶ Timothy McAlindon,¹

ABSTRACT

BACKGROUND

Previous research has suggested that tai chi offers a therapeutic benefit in patients with fibromyalgia.

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ABSTRACT

OBJECTIVES

To determine the effectiveness of tai chi interventions compared with aerobic exercise, a current core standard treatment in patients with fibromyalgia, and to test whether the effectiveness of tai chi depends on its dosage or duration.

DESIGN

Prospective, randomized, 52 week, single blind comparative effectiveness trial.

SETTING

Urban tertiary care academic hospital in the United States between March 2012 and September 2016

strategies, physical function limitation, sleep, and health-related quality of life.

RESULTS

FIQR scores improved in the combined tai chi group significantly more than the control group in FIQR scores at 24 weeks (mean difference between groups=5.5 points, 95% CI=1.2 to 10.4, P=0.03) and severity of pain (patient's global assessment of pain, P=0.005; anxiety=1.2 points, self efficacy=1.0 points, coping strategies, 2.6 points).

Annals of Internal Medicine

Comparative Effectiveness of Tai Chi Versus Physical Therapy for Knee Osteoarthritis

A Randomized Trial

Chenchen Wang, MD, MSc; Christopher H. Schmid, PhD; Maura D. Iversen, SD, DPT, MPH; William F. Harvey, MD, MSc; Roger A. Fielding, PhD; Jeffrey B. Driban, PhD; Lori Lyn Price, MAS; John B. Wong, MD; Kieran F. Reid, PhD, MPH; Ramel Rones; and Timothy McAlindon, MD, MPH

Background: Few remedies effectively treat long-term pain and disability from knee osteoarthritis. Studies suggest that Tai Chi alleviates symptoms, but no trials have directly compared Tai Chi with standard therapies for osteoarthritis.

Objective: To compare Tai Chi with standard physical therapy for patients with knee osteoarthritis.

Design: Randomized, 52-week, single-blind comparative effectiveness trial. (ClinicalTrials.gov: NCT01258985)

points]; physical therapy, 143 points [CI, 119 to 167 points]). The between-group difference was not significant (24 points [CI, -10 to 58 points]). Both groups also showed similar clinically significant improvements in pain (Tai Chi, 2.6 points [CI, 1.2 to 4.0 points]; physical therapy, 2.6 points [CI, 1.2 to 4.0 points]).

was consistent across instructors. No serious adverse events occurred.

Seminal Articles on Tai Chi by our collaborator at Tufts: Chenchen Wang, MD, MSc

Tai Chi Feasibility Study

- Goals of this study:
 - Assess satisfaction and safety
 - Gain qualitative feedback about Tai Chi

Participants

- 35 Veterans were referred or contacted by telephone.
- 17 Veterans with symptoms of PTSD enrolled, participated, *and completed* this study in two cohorts.

“Taste” of Tai Chi

- Two 4-session Tai Chi groups
- Up to 9 veterans in each group
- Each weekly session was about 60 minutes
- Conducted by a trained Tai Chi instructor with over 20 years of experience

“Taste” of Tai Chi

- Program was derived from classical Yang style Tai Chi 108 posture.
- Every session included:
 - Warm-up/stretching
 - Tai Chi principles
 - Tai Chi movement
 - Breathing techniques
 - Relaxation

Tai Chi Home Practice

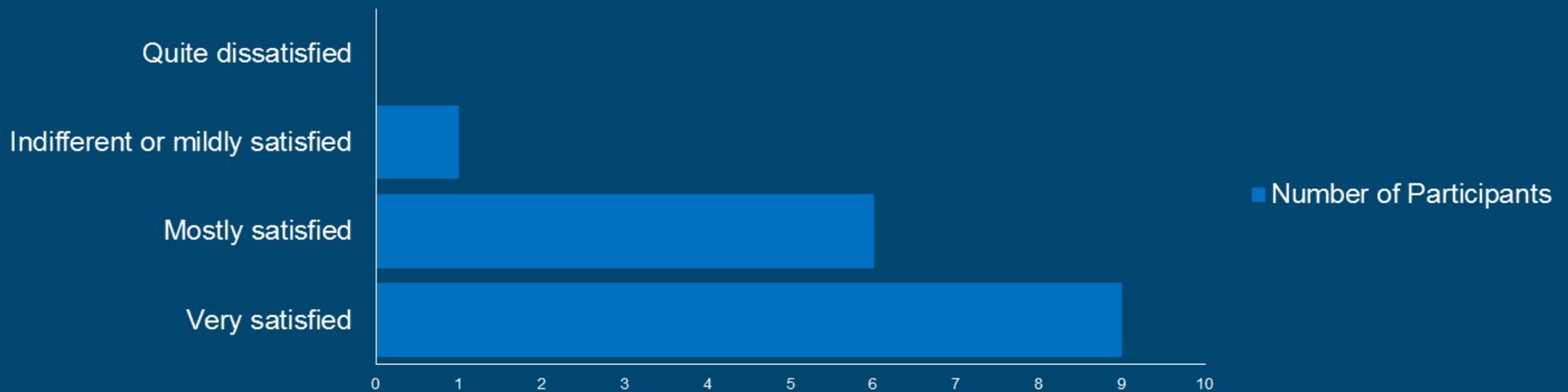
- Veterans asked to practice for 30 minutes/day at home
- Monitored via daily practice logs

Focus Groups and Interviews

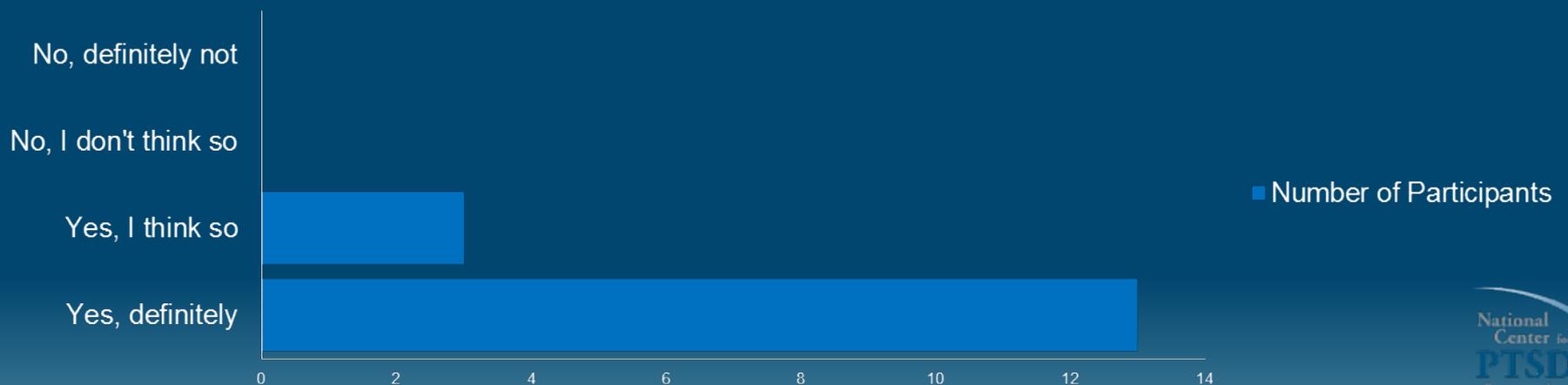
- At the end of the intervention:
 - Focus group
 - Individual interviews
 - Audiorecorded
 - Used open-ended questions

Satisfaction Results

In an overall, general sense, how satisfied are you with the Tai Chi program?



If this Tai Chi program was offered again, would you come back?



Qualitative Analysis

- Interviews transcribed
- Analyzed by committee
- Iterative coding process
- Themes identified
- Chose quotes that best represented themes

Perception of Tai Chi

- *“It’s comfortable for everybody no matter how young or old you [are], no matter the condition of your body”.*
- *“I used the words ‘warrior spirit’ because you know Veterans...and soldiers...something that’s like martial arts is more in tune [with] a ‘warrior’s spirit.’”*



Participant Engagement

- *“It’s hard to get us [Veterans] engaged in things. I feel like the class did and each person...was engaged ...even though a lot of us have disabilities...we put that to the side to be a part of the group.”*
- *“I was able to calm my mind enough that that was the only thing I was focusing on.”*

Benefits for Symptoms

- *“I’m not as jumpy as I used to be...my dreams have subsided too.”*
- *“I think it’s given me hope...I’ve done a lot of different things and this is just an additional tool in my toolbox.”*
- *“It’s very helpful...I think all Veterans, suffering from PTSD or not, could use [it].”*

Benefits for Symptoms

- *“I like the fluid movement of Tai Chi, it takes me out of my depression and my anxiety...I feel great when I’m doing it, I feel better when I’m finished. [Tai Chi] is helping me breathe better...and to concentrate better and I don’t get as distracted with my symptoms.”*

Benefits for Pain

- *“When we had to sit on the edge of our seats and that’s because I have a back problem and I can’t stay sitting like that for a while. So that was a bit uncomfortable, but as you’re going through the exercise you start to relax more and it actually loosens up my muscles a lot”*
- *“I had a workout. And that felt good.”*

Comfort with Tai Chi

- *“I’m hyper-vigilant and...there were actually people behind me, males behind me and I was calm enough to do [Tai Chi]...your stretching is done upright...there’s no time where you’re prone so I like that. It makes a huge difference with sexual trauma...like last week I was the only female in the group and normally I would just leave...but I was actually closing my eyes and everything.”*

Tai Chi Home Practice

- *“When I do it at home, it’s relaxing. It helps.”*
- *“I was doing half an hour in the morning, half an hour in the afternoon, half an hour in the evenings.... I was doing an hour and a half a day.”*

Suggestions for Improvement

- Homework handouts were unhelpful
 - *“The homework papers I didn’t think were very helpful...”*
- Videos would be helpful
 - *“It’d be nice if they could give you a video to take home, that you could play and while you’re doing it, at your own place...that you could go along with the video.”*
- A longer intervention would be better
 - *“I found that was really short...just the four weeks of it.”*

More Suggestions for Improvement

- More space
 - *“I felt like I was going to bump into them or something, I kept of trying to...it felt like I was always moving out of there way so...”*
- Staff member in the Tai Chi room
 - *“Maybe, yeah if there was somebody else there, a staff member there and like not as knowledgeable about Tai Chi but knowing what he’s trying to do and say if you’re uncomfortable or if you’re having problems, whatever, address it to me and let the instructor continue on with the class.”*

Conclusions of Tai Chi “Taste”

- Tai Chi was perceived as a powerful intervention.
- Can be done by anyone despite age or physical limitations
- Particularly good fit for veterans
- Particularly good fit for MST survivors
- Additional research is needed to evaluate Tai Chi for PTSD.

How Tai Chi Can Help PTSD

- Arousal reduction
 - Improves sleep
 - Reduces irritability and reactivity
- Improves health and wellbeing
 - Reduces pain
- Develop positive associations with warrior stances

Current Project: Tai Chi for Gulf War Illness

1990-1991 Gulf War service



What is Gulf War Illness?

- Exposure to various toxins:
 - nerve agents
 - pesticides
 - oil well fire emissions
- Symptoms (mind and body):
 - chronic pain
 - cognitive & mood impairments
 - Fatigue
- **No proven treatment for GWI**

Current Study: RCT For Gulf War Illness

12 weeks, Twice weekly (24 sessions)



or



Whole Health
Wellness Program
60 GW veterans

Tai Chi
60 GW veterans

Novel Interventions for Pain in Gulf War Illness

Goals

- Compare efficacy of Tai Chi and Whole Health Wellness to address chronic pain
- Gain qualitative feedback about Tai Chi and Whole Health

Methods:

- 120 Veterans with Gulf War Illness
- Random assignment to Tai Chi or Whole Health Workshop
- Twice weekly for 12 weeks

Measuring:

- Chronic Pain (Primary outcome)
- Fatigue, endurance, QOL, cognitive functioning, insomnia, depression

Currently Recruiting. Please refer Boston-area Veterans of 1990-91 Gulf War to our study!

Lessons Learned

- Large, open rooms for Tai Chi are hard to find and schedule
- Consistency in when and where classes are held is preferred
- Week-day sessions are limiting
- Logistics (weather, parking, traffic, time of day) are important

Lessons Learned

- Instructors' experience
 - Tai Chi
 - Research
- Clinician in the room can be helpful
- Cohort is helpful
 - Sequential learning
 - Social support
- Small classes are good when getting started

Thank you for listening!

??Questions??

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