

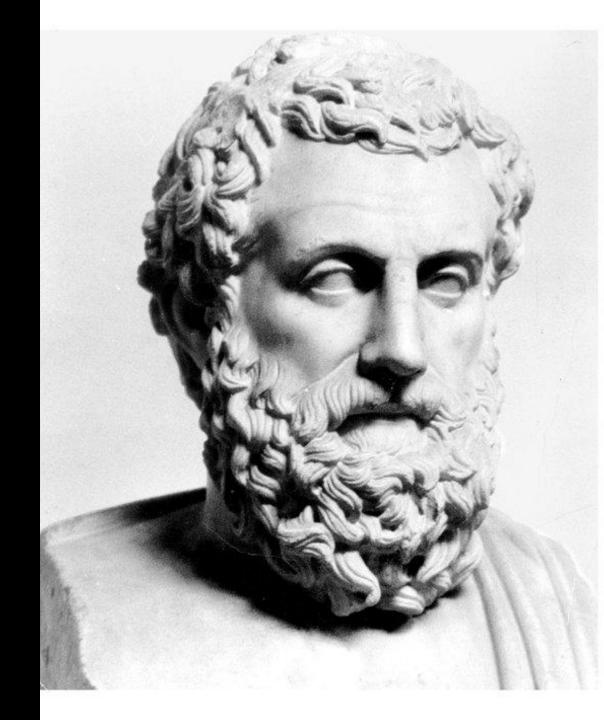


THE CONCEPT OF CHI

a life-giving, vital energy that unites body, mind and spirit.

ARISTOTLE

ANCIENT GREEK PHILOSOPHER 17TH CENTURY



THE BASIC SCIENTIFIC METHOD

- 1. Observe and develop a hypothesis
- 2. Conduct an experiment to test it
- 3. Report on the results
- 4. Consider the implications



THE STRUCTURE OF A SCIENTIFIC PAPER

1. Introduction

- Observe and develop a hypothesis

2. Methods

- Conduct an experiment to test it

3. Results

- Report on the results

4. Discussion

- Consider the implications

The American Journal of Chinese Medicine, Vol. 32, No. 3, 453–459

© 2004 World Scientific Publishing Company
Institute for Advanced Research in Asian Science and Medicine

Effects of Tai Chi Exercise on Physical and Mental Health of College Students

Yong "Tai" Wang, Leslie Taylor, Marcia Pearl and Li-Shan Chang

Department of Physical Therapy, Georgia State University, Atlanta, GA, USA

Abstract: The purpose of this pilot study is to examine the effects of Tai Chi Quan, a bodymind harmony exercise, on college students' perceptions of their physical and mental health. A three-month intervention of Tai Chi exercise was administered to college students, and multidimensional physical (PHD) and mental (MHD) health scores were assessed using the SF-36v2 health survey questionnaire before and after the intervention. Thirty college students participated in a 1-hour-long Tai Chi exercise intervention twice a week for 3 months. Each practice session included 10 minutes of breathing and stretching exercises followed by 50 minutes of Tai Chi Quan 24-form practice. PHD including physical function (PF), role physical (RP), bodily pain (BP), general health (GH), and MHD including social function (SF), role mental/emotion function (RE), vitality (VT), perceptions of mental health (MH) were assessed. The normalized scores of each variable and the combined PHD or MHD scores before and after the Tai Chi intervention were examined by paired t-test (p < 0.05). Physical measures of BP and GH, and mental measures of RE, VT and MH were significantly improved after Tai Chi exercise intervention. When the overall PHD or MHD scores were evaluated, the MHD had increased significantly. In conclusion, Tai Chi exercise had positive effects on the self-assessed physical and mental health of college students. Scores on the mental health dimension appeared to be particularly sensitive to change. Colleges/universities might consider offering Tai Chi as a component of their ongoing physical activity programs available to students.

Keywords: Tai Chi Quan; Physical and Mental Health.

Introduction

Tai Chi or Tai Chi Quan is internationally popular for its effects and benefits for overall health. Ryan (1974) described Tai Chi as an exercise, a dance, a method of achieving mental

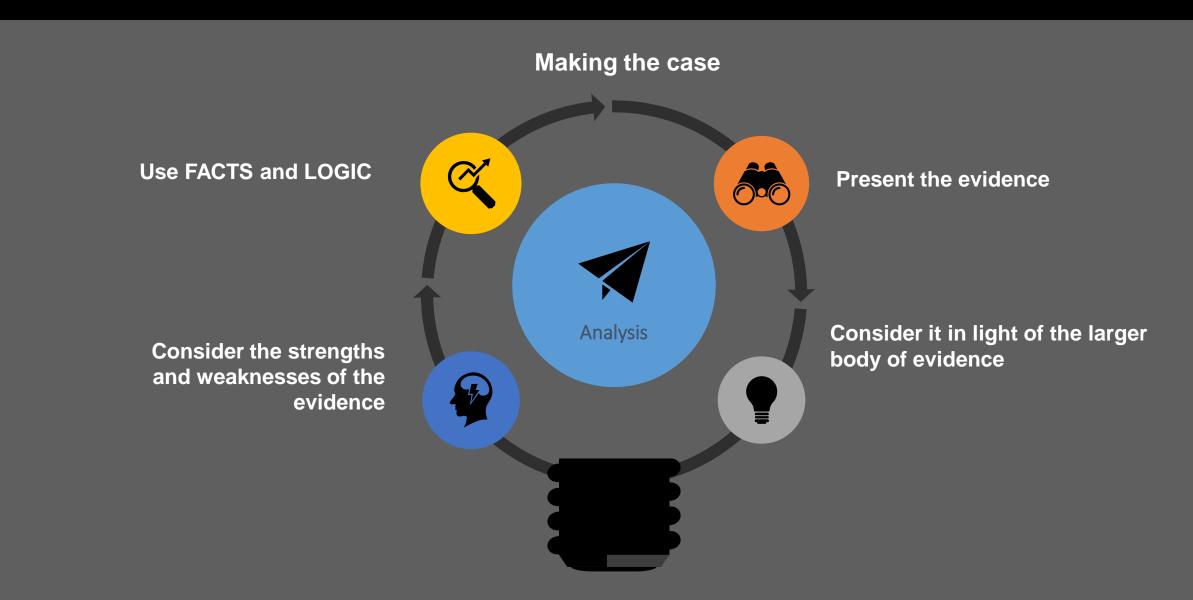
Correspondence to: Dr. Yong "Tai" Wang, Department of Physical Therapy, Georgia State University, 24 Peachtree Center Avenue, Building: Keil Hall, Suite 700, Atlanta, GA 30303, USA. Tel: (+01) 404-651-3131, Fax: (+01) 404-651-1584, E-mail: ywang/@gsu.edu

PROOF IS RARELY DEFINITIVE

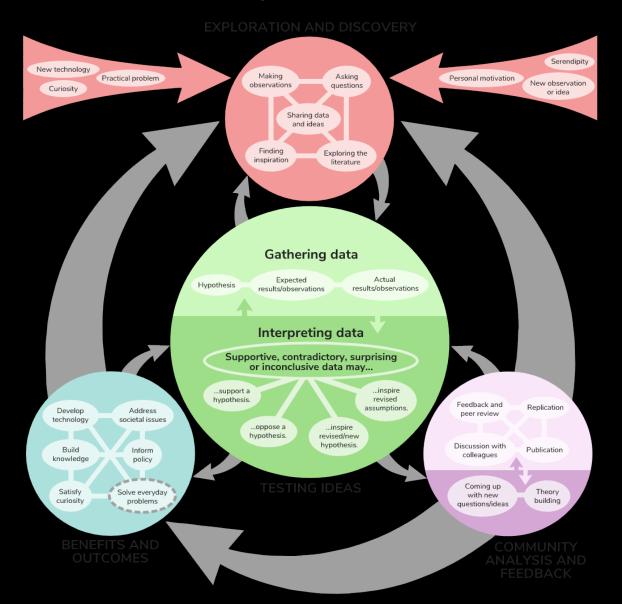
It is always open to revision and debate

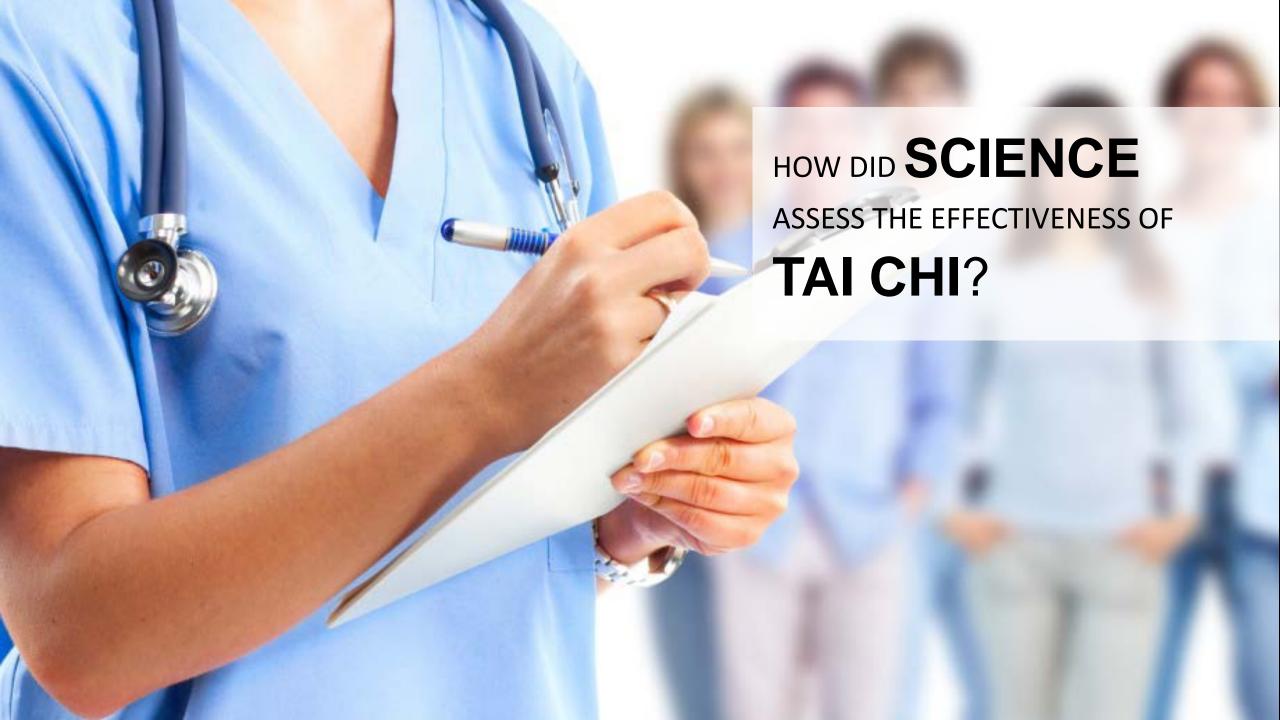


A "body of evidence" needs to be accepted by the scientific community



Science is a continuous and iterative process





WHAT IS COMPELLING EVIDENCE?

Compelling clinical trial evidence has two cardinal features

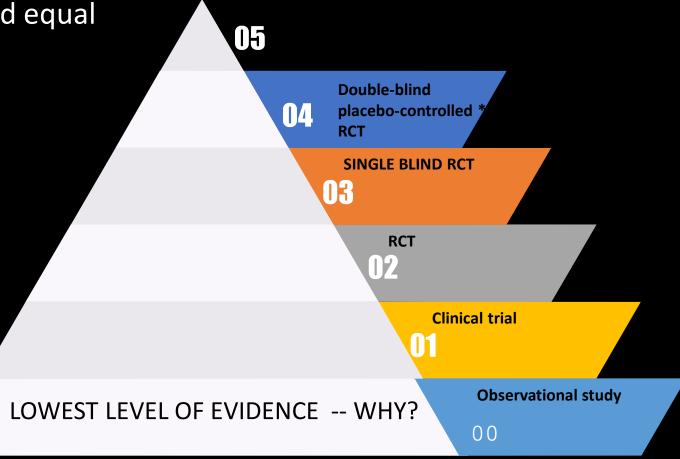
- **#1 A RESEARCH DESIGN THAT HAS MINIMAL BIAS**
- **#2 FINDINGS THAT ARE REPLICATED = REPRODUCABILITY**

#1 MINIMIZING BIAS

Not all clinical trials are created equal

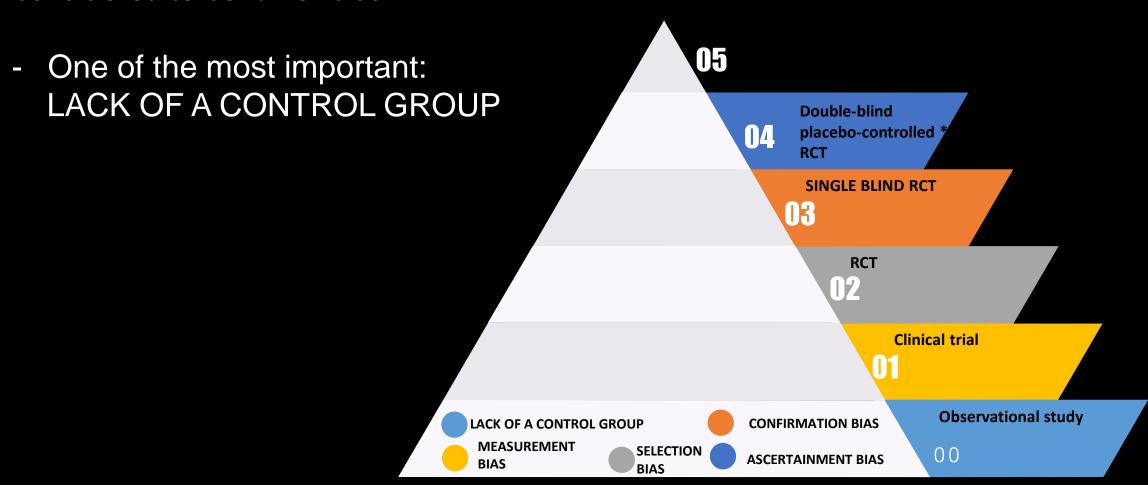
- THERE IS A HIERARCHY
OF EVIDENCE

 Research often begins with with quite simple research and, if results are promising, more sophisticated research follows



OBSERVATIONAL STUDY

Considered to be full of bias



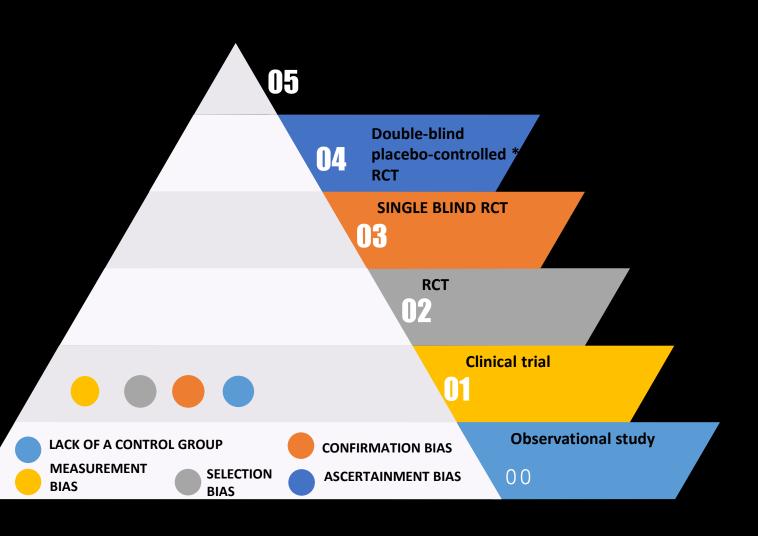
CLINICAL TRIAL

Includes a control group

- 1. Tai Chi group
- 2. People on a waiting list

Most important source of bias:

SELECTION BIAS



RANDOMIZED CONTROL TRIAL (RCT)

Random allocation of research participants

Tai Chi or control group

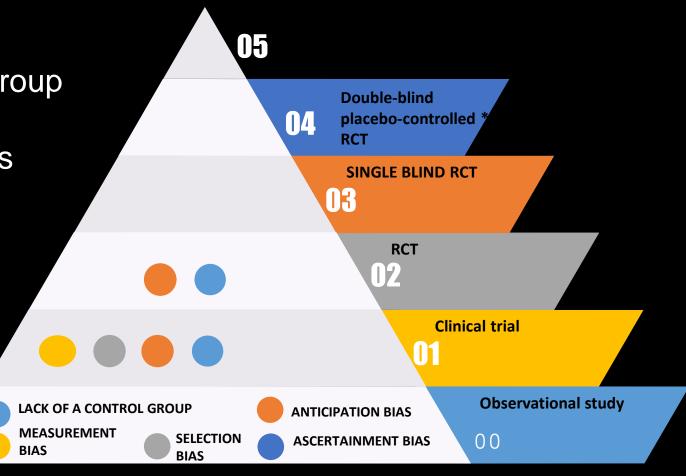
- Solves the lack of the control group

- Solves the selection bias

Often solves measurement bias

- BUT... it still has

- ASCERTAINMENT BIAS

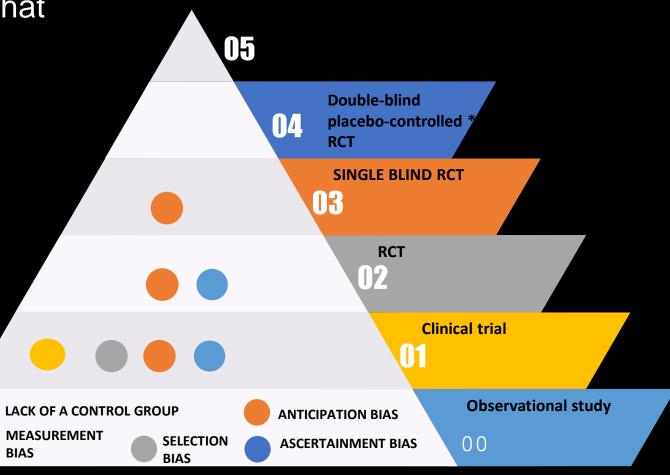


SINGLE BLIND RCT

Those measuring outcomes and analyzing the data do not know what group participants are in (just Group A or B)

- Solves FOUR types of bias

Anticipation bias remains (but that wears off after awhile)



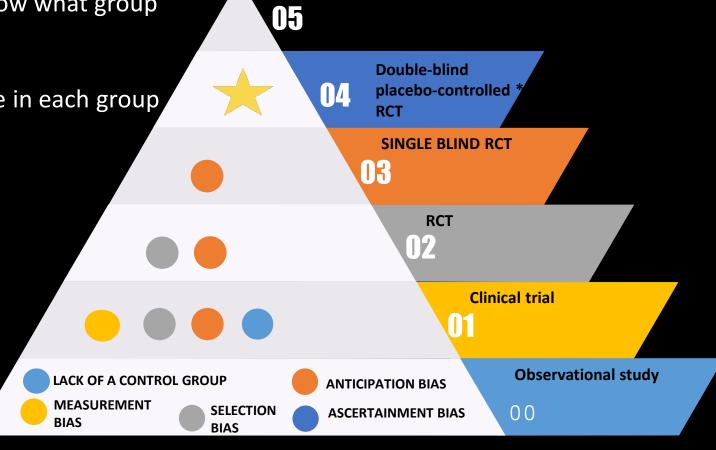
DOUBLE BLIND RCT

- Participants don't know what group they are in

Those measuring outcome don't know what group participants are in

Intervention appears to be the same in each group

MINIMIZES BIAS



So far...

Clinical research often begins with a simple observational study

Clinical trials become increasingly more complex to MINIMIZE BIAS

- The best clinical trial for TAI CHI is a single blind RCT -- WHY?
 - Because you cannot blind participants regarding what group they are in.

#2. FINDINGS ARE REPLICATED

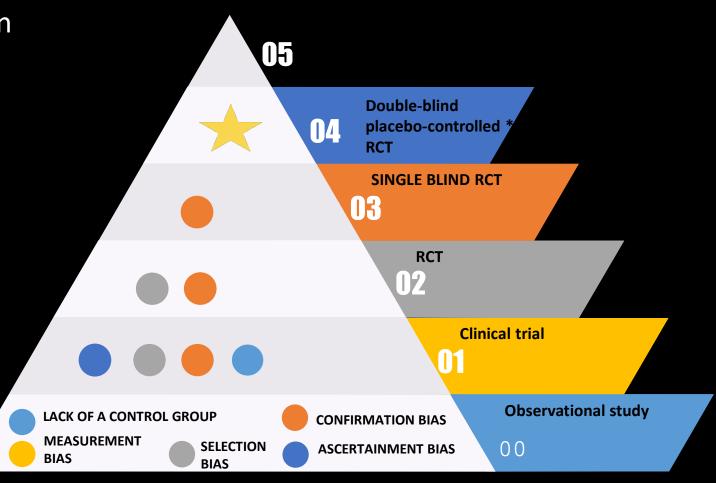
Basically: The only thing better than one clinical trial...

is MULTIPLE CLINICAL TRIALS

And that is why scientists

LOVE

systematic reviews

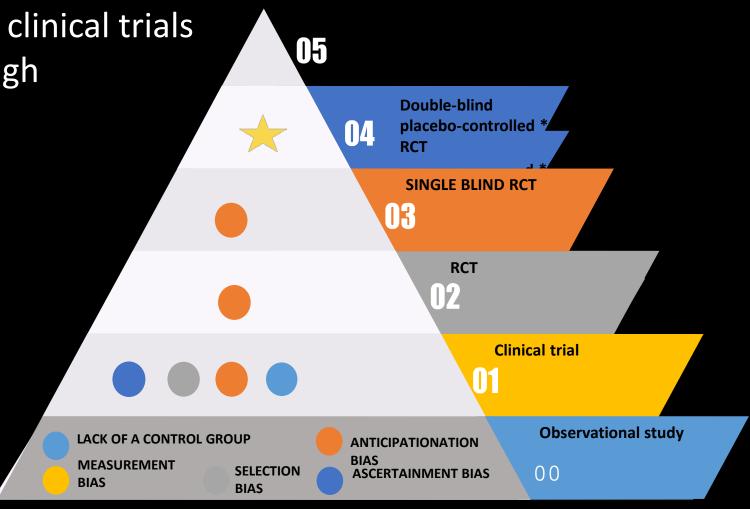


WHAT IS A SYSTEMATIC REVIEW?

It summarizes the results of all clinical trials on a given topic to provide a high level of evidence

- Cochrane Collaboration

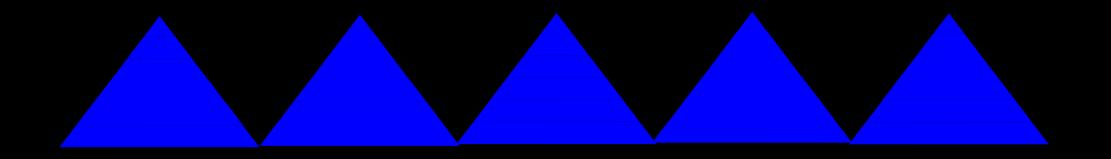
However, this does include the earlier and simpler trials that have sources of bias...



THE ONLY THING BETTER THAN ONE SYSTEMATIC REVIEW IS...

MULTIPLE SYSTEMATIC REVIEWS -- WHY?

PROVIDE UPDATES AS NEW EVIDENCE COMES IN



TO SUM UP

Scientific research is based on experiments

For clinical trial research, systematic reviews are considered the highest level of evidence because:

They have the two cardinal features of compelling scientific evidence:

- A research design that minimizes bias
- Replicated results



On effectiveness of

TAI CHI:

What we know

INTRODUCTION

• Another physician and Tai Chi practitioner and I had observed — and experienced — a number of health benefits from Tai Chi.

As physicians we asked ourselves:

What is the evidence?

METHODS

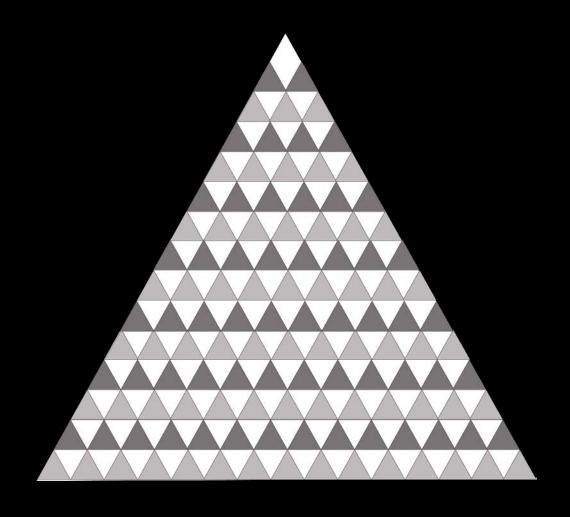
- We conducted a literature search of **SYSTEMATIC REVIEWS**
- Assessed the overall level of evidence for each topic as:
 - 5 ★ EXCELLENT
 4 ★ GOOD
 3 ★ FAIR
 2 ★ PRELIMINARY
 - No evidence of direct benefit

A few trials

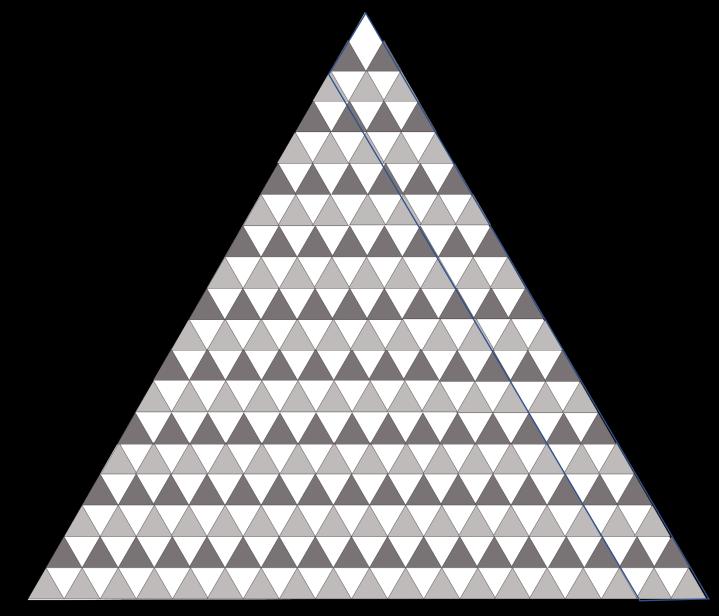


RESULTS

In October 2015: 120 systematic reviews...

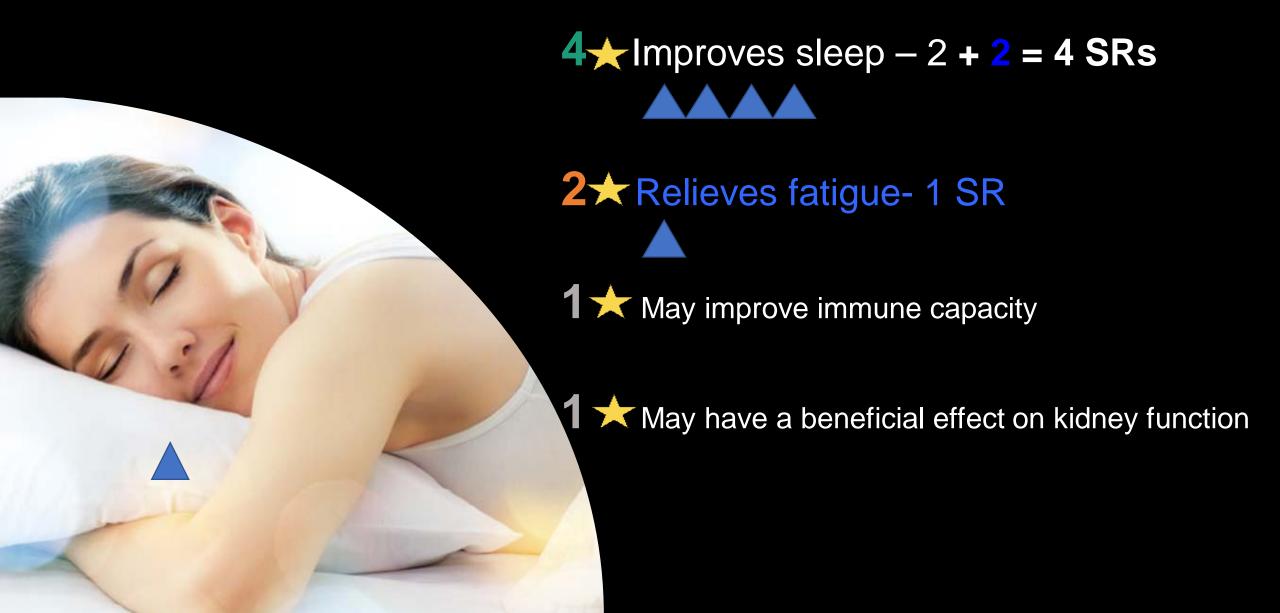


By April 2019: 60 MORE!





PROMOTES PHYSICAL HEALTH



PROMOTES FITNESS

5 the Improves BALANCE - 10 SRs

5 the Improves AEROBIC CAPACITY

- 5SRs
- Especially for the de-conditioned



Especially lower leg strength

Improves **FLEXIBILITY** - 1 SR

Especially arm mobility





PROMOTES PHYSICAL HEALTH

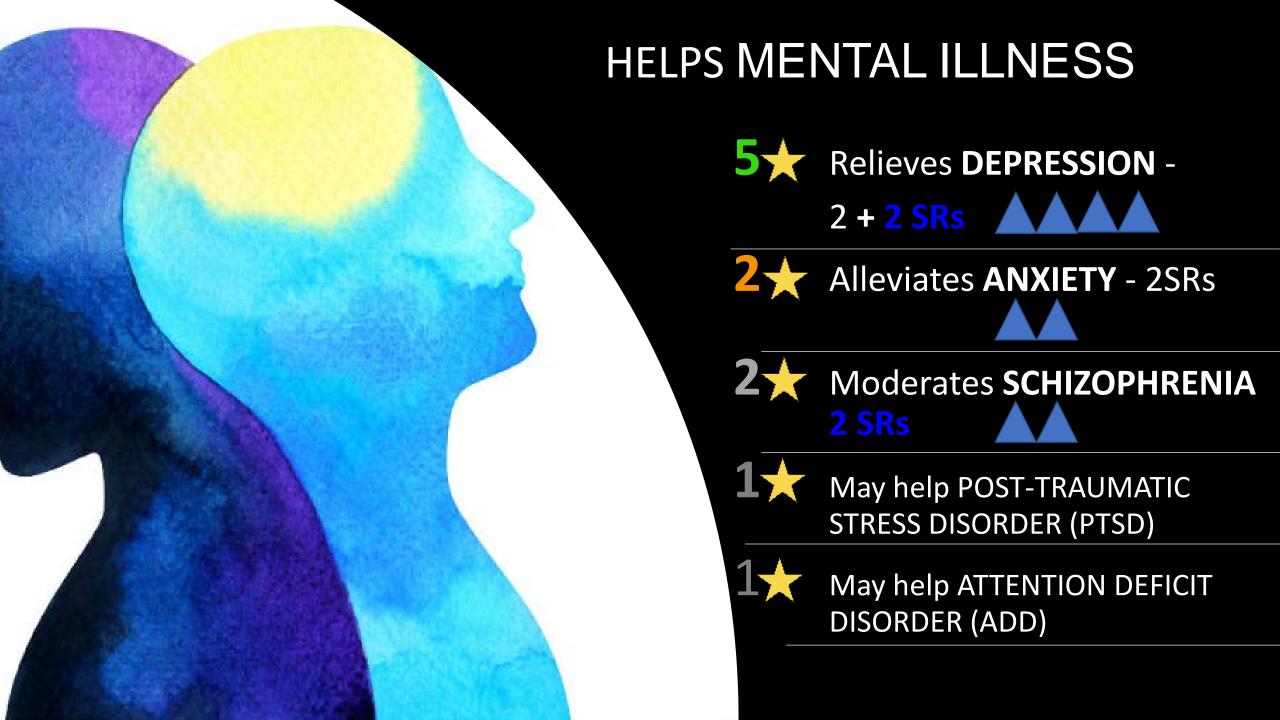
5 \(\pm\) Prevents **FALLS IN THE ELDERLY - 14 + 3 SRs** = 17 SRs!

This can have a huge impact

PROMOTES MENTAL HEALTH

- 5 ★ Optimizes MENTAL ALERTNESS
 - 5SRs
 - Attention, memory, executive functioning
- 4 \bigstar Fosters WELL-BEING 4 + 1 SRs
- 2 * Improves SELF-EFFICACY 1 SR
- 2 * Alleviates STRESS 1 SR





PREVENTS DISEASE

5 🛨 Decreases risk of **DEMENTIA** -

















0241

REVERSES DISEASE PROGRESSION



5 the Improves PARKINSON disease

Improves dementia



SLOWS DISEASE PROGRESSION

3 * Improves diabetes control

4 + 4 SRS rated as a ZERO before

3 ***** Relieves **low back pain**

1 + 3 **SRs**

2 * Improves heart failure

2 + 2 SRS rated as a ZERO before



AND MORE...

Multiple sclerosis - Now 2 SRs

Hypertension - 4 SRs

Fibromyalgia - 4 SRs

NEW AREAS:

Inflammatory bowel disease - 2 SRs Weight management - 1 SR APPeri-menopausal symptoms -1 SR

USEFUL IN REHABILITATION

- **CARDIAC** rehabilitation
- **5★ STROKE** rehabilitation
 - 5 + <u>5 SRs</u>
- **5 COPD** rehabilitation
 - 2 + <u>5 SRs</u>
- **5 CANCER** and quality of life
 - 5 + <u>5 SRs</u>

A NOTE ABOUT SAFETY

No safety concerns have been identified

- One review of 153 trials: No serious adverse effects were reported
- Muscle strains were occasionally reported
 - Peter Wayne et al 2014

DISCUSSION

A remarkable amount of clinical research has been done on Tai Chi

Rapidly developing area (15 + articles published/month)

STRENGTHS

Many systematic reviews that increasingly include high-quality RCTs.

WEAKNESSES

-- Studies include different styles, teachers, forms, lengths of study and frequencies

IS IT STARTING TO CHANGE PRACTICE?

PROFESSIONAL GUIDELINES

- Europe: Fibromyalgia
- US: Osteoarthritis, Low back pain,
- Canada: Osteoarthritis of the knee*

REHABILITATION PROGRAMS

- Cardiac, stroke, COPD,
- Supportive cancer care

PUBLIC HEALTH PROGRAMS

- Demonstration project with elderly showed 50% decrease in falls

NOT COVERED BY INSURANCE

- Health care plans
- Disability insurance

Tai chi research identifies important benefits for individual health but also -- due to its effect on multiple, common conditions -- suggests great potential for population health.

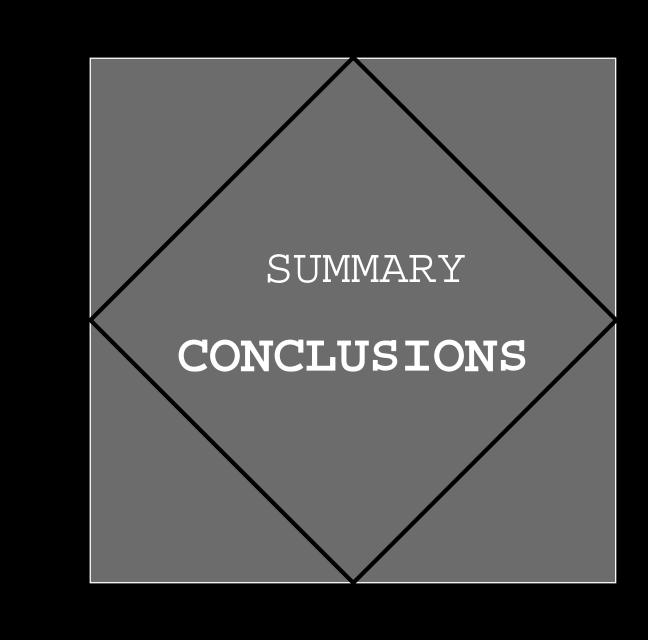
- communities, schools, the workplace
- cultural benefit











1. There is a remarkable amount of scientific evidence on the multiple health benefits of Tai Chi



 Despite this evidence, Tai Chi is only beginning to be integrated into mainstream medical practice.
 This could be due to a number of reasons... 3. To a large extent, the "jury is still out". The scientific debate on Tai Chi is in its early days. And like many things, there are going to be early adopters and late adopters.

The urge to understand the world through evidence, logic and DEBATE is still in scientists' DNA



4. Although science has been able to document many benefits of Tai Chi, there is a lot that we still do not know.



- Ultimately, the scientific discovery of the health benefits of Tai Chi has been an exercise in cultural exchange.
 - East meets West
 - Inductive and deductive reasoning

