Complementary and Alternative Treatments for Late-Life Mood Disorders

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Objectives

- To review the studies of CAM use for late life mood and cognitive disorders
- Complementary use of Tai Chi to improve outcomes in geriatric depression (NCCAM)
- The use of daily yogic meditation to reduce stress and improve cognition in informal (family) dementia caregivers
Summary of CAM

- CAM therapies are defined by the National Center for Complementary and Alternative Medicine (NCCAM) as a group of diverse medical and health systems, practices, and products that are not currently considered to be part of conventional medicine.

- An alternative approach to mental health care is one that emphasizes the interrelationship between mind, body, and spirit.

- The use of CAM in the US is increasing rapidly, exceeding a prevalence of 60% with 47% increase in visits to CAM practitioners, $21.2 billion spent, with at least $12.2 billion of out-of-pocket expenditures, by the 2002 National Center for Health Statistics.

- Most commonly used CAM approaches include prayer and megavitamin supplements.

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NCCAM has divided CAM into 5 sub-categories

- **WHOLE MEDICAL SYSTEMS**
  - built upon complete systems of theory and practice
  - Examples: Ayurveda, Traditional Chinese medicine, Naturopathy, Homeopathy

- **MIND-BODY PRACTICES**
  - a variety of techniques designed to enhance the mind's capacity to affect bodily function and symptoms
  - Examples: Tai Chi, yoga, meditation, prayer, music therapy

- **MANIPULATIVE AND BODY-BASED PRACTICES**
  - based on manipulation of one or more parts of the body
  - Examples: chiropractic, massage, accupressure

- **ENERGY-BASED PRACTICES**
  - Biofield therapies are intended to affect energy fields that purportedly surround and penetrate the human body. The existence of such fields has not yet been scientifically proven, e.g. Reiki, Qi gong
  - Bioelectromagnetic-based therapies involve the unconventional use of electromagnetic fields, such as pulsed fields, magnetic fields

- **BIOLOGICALLY-BASED PRACTICES**
  - Bioelectromagnetic-based therapies involve the unconventional use of electromagnetic fields, such as pulsed fields, magnetic fields

http://nccam.nih.gov/health/whatiscam/
Difficulties in Performing Research Studies

- Diagnostic approaches in the Eastern and Western Medicine are principally different
- Categorical DSM diagnoses are not consistent with the Eastern diagnoses (by pulse, tongue, meridians), and therefore, recommended therapeutic approaches should be different (=many depressions, anxieties, insomnias)
- Differences in practices and the lack of standardization among trained CAM professionals
- Difficult to translate into the accepted research design, and Western outcomes
- Self-selected bias in the volunteers
- Placebo effect maybe inflated in CAM

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<table>
<thead>
<tr>
<th>Mode of intervention</th>
<th>Postulated mechanism of action</th>
<th>Scientific Evidence</th>
<th>Main adverse effects and rug interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>St John’s wort</td>
<td>MAOI and reduced monoamine reuptake, and Decreased amyloid production in rodent models of AD</td>
<td>Close to 40 RCTs</td>
<td>Positive animal studies; Mania; serotonergic syndrome; photosensitivity; multiple drug interactions with HIV protease inhibitors, warfarin, digoxin, oral contraceptives, anticonvulsants</td>
</tr>
<tr>
<td>Omega-3 fatty acids (fish oil)</td>
<td>Mood stabilization, Memory enhancement, neuroprotection, reduction in amyloid production</td>
<td>Several RCTs are mixed or negative in the effect on mood and wellbeing</td>
<td>Several RCTs are mixed or negative in the effect on cognition; Fishy aftertaste; gastrointestinal distress; increased effect of warfarin and NSAIDs</td>
</tr>
<tr>
<td>SAMe</td>
<td>Cofactor in neurotransmitter synthesis, methylation homocysteine to methionine</td>
<td>Several RCTs, Parenteral SAMe is superior to placebo</td>
<td>Animal studies are suggestive of potential use; No human studies available; Mania; gastrointestinal distress; headache interaction with SSRIs</td>
</tr>
<tr>
<td><strong>Folate and B12</strong></td>
<td>Cofactor in neurotransmitter synthesis, methylation homocysteine to methionine, precursor to SAMe</td>
<td>Folic acid is an effective adjunct</td>
<td>RCTs are suggestive of usefulness in prevention of cognitive decline and improved memory performance</td>
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<tr>
<td><strong>Gingko Biloba</strong></td>
<td>Scavenging free radical; lowering oxidative stress; reducing neural damages; increased blood flow to the brain;</td>
<td>Several RCTs in postmenopausal women, and for sexual side effects of antidepressants-Mixed results</td>
<td>Mixed results in RCTs of dementia and other cognitive disorders</td>
</tr>
<tr>
<td><strong>Ayurveda</strong></td>
<td>Indian treatment system with the use of herbs, diet and lifestyle to achieve balance in cognition and well-being</td>
<td>Few studies suggestive of positive effect</td>
<td>Few RCTs Suggestive of positive effect</td>
</tr>
<tr>
<td><strong>Acupuncture</strong></td>
<td>Balancing energy flow through the meridians in the body</td>
<td>Small RCTs with poor controls, randomization and blinding and Inconclusive results</td>
<td>In a few trials improved memory and other cognitive tests in AD and VAD</td>
</tr>
<tr>
<td><strong>Yoga</strong></td>
<td>Postures, breath, meditation-rebalancing the mind-body connections</td>
<td>Reduces depression and enhances wellbeing in a few studies</td>
<td>A few uncontrolled studies showed improved attention and memory in nondemented adults</td>
</tr>
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<tr>
<td><strong>Biofeedback</strong></td>
<td>Retraining of the autonomic nervous system or alpha-brain waves</td>
<td>No data available</td>
<td>Alpha peak in brain waves is associated with enhanced cognitive performance</td>
</tr>
<tr>
<td><strong>Spirituality</strong></td>
<td>Lowers stress and enhances cognition via church attendance and prayer</td>
<td>Improves depression in practitioners</td>
<td>Enhances cognitive performance in those who attend church</td>
</tr>
<tr>
<td><strong>Exercise</strong></td>
<td>Improved cardiovascular function, release of endorphins, increased energy, mental stimulation</td>
<td>Improved mood and wellbeing, especially in minor depression</td>
<td>Modest improvement in cognition in dementia</td>
</tr>
</tbody>
</table>
Need for more research

- Late-life mood disorders and cognitive aging are the most common reasons for using complementary and alternative therapies.
- The amount of rigorous scientific data to support the efficacy of complementary therapies in the treatment of depression is extremely limited.
- Most evidence for beneficial effects for exercise, herbal therapy (Hypericum perforatum), the use of fish oil, and, acupuncture and relaxation therapies.
- Need for further research with randomized controlled trials to investigate the efficacy of CAM therapies for treatment of mood, insomnia, and cognitive disorders in late-life.
- This research may lead to the development of effective treatment and preventive approaches for these serious conditions.

Lavretsky, Aging Health, February 2009
RCTS of CAM

- Rationale and Methods Behind the Review
- Overview of Studies Reviewed
- Comparisons of “positive” and “negative” studies
Planning the review

■ Study type
  ■ RCT
  ■ N ≥ 30
  ■ Duration ≥ 2 weeks
  ■ English language
Evaluating CAM Study Methodology

- Were there clearly stated *a priori* hypotheses?

- Was the sampling procedure adequately described?

- Was the method used to generate the sequence of randomization described (e.g., random numbers table or computer-generated list of random numbers)?

- Was randomization successful in eliminating significant differences between groups (e.g. demographics, baseline outcome measures)? If not, were randomization failures controlled for in data analysis? (Yes on either = 1)

- Were subjects adequately blinded to treatment assignment (by use of a credible placebo/active control, sham treatment, or psychosocial control)? If not, did the comparison group involve an active intervention (i.e. other than waiting list or treatment as usual)?
Were subjects’ expectations of benefits from a given treatment, attitudes toward treatment assignment, or sense of the treatment’s credibility

Was the active treatment standardized for all participants? (E.g. Was a reproducible protocol described or the source of a biological compound listed?)

Was the fidelity of the treatment intervention assessed? (E.g. Assessing therapist adherence to treatment protocol or assays of biological substances to ensure equivalence among doses administered)

Was treatment adherence assessed and factored into data interpretation if rates differed significantly between groups?

Were side effects/adverse events monitored and reported?

Were the inclusion and exclusion criteria described clearly?

Were inclusion/exclusion criteria standardized so as to make them reliably reproducible?
● Were the number of dropouts and their reasons for leaving described?
● Were outcome measures appropriate to assess the hypotheses and well-validated?
● Were outcome assessments clearly obtained in a blinded manner?
● Was there appropriate statistical analysis?
● Did analysis attempt to control for possible confounding variables?
● Were type I and/or type II errors adjusted for?
● Did the data justify the conclusions?
● Were the limitations of the study discussed?
Planning the Review

- Studies were rated as “positive” if they reported that the experimental CAM intervention yielded significantly better ($p<0.05$) outcomes than the control group (or outcomes statistically equivalent to an evidence-based active control) on at least one primary outcome measure related to depression, anxiety, or sleep.
Results

- 855 possible studies
- 39 meet original criteria (4 retrieved from manual reference search)
- 6 studies noted to enroll only “healthy older adults”, ie no baseline sxso more like prevention trials (all 6 were negative)
- 33 studies included
Results

- Types of CAM studied
  - Mind-body (12)
    - 1 yoga, 3 music, 2 qigong exercises, 1 Tai Chi, 3 relaxation, 2 meditation
  - Biological (9)
    - 4 melatonin, 1 each TCM herbs, ginkgo, St Johns wort, vit B12, and soy protein
  - Energy-based (9)
    - 2 external qigong, 4 light therapy, 2 acupuncture, 1 magnetic auricular therapy
  - Body-based (3)
    - 2 acupressure, 1 aromatherapy massage
RESULTS

- 67% studies “positive”
- sample size from 30 to 202 (mean 67)
- duration from 2 to 52 weeks (mean 8.5)
- average participant age from 61 to 82 years (mean 70.5)
- Only one-third of the studies were conducted in the US, with the rest coming from Europe (24%), Asia (33%), or elsewhere (9%).
- Proportions of studies which had at least one outcome measure assessing each symptom were as follows: depression, 54.5% (18/33); anxiety, 30.3% (10/33); and sleep disturbance, 54.5% (18/33).
<table>
<thead>
<tr>
<th></th>
<th>Positive studies</th>
<th>Negative studies</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Sample size</td>
<td>63.6 (36.5)</td>
<td>73.6 (52.0)</td>
</tr>
<tr>
<td>Average age (years)</td>
<td>70.7 (5.6)</td>
<td>70.1 (4.4)</td>
</tr>
<tr>
<td>Treatment duration (weeks)</td>
<td>7.7 (6.4)</td>
<td>10.2 (14.1)</td>
</tr>
<tr>
<td>CAM category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mind-body</td>
<td>10 (45.5)</td>
<td>2 (18.2)</td>
</tr>
<tr>
<td>Biological</td>
<td>4 (18.2)</td>
<td>5 (45.5)</td>
</tr>
<tr>
<td>Energy-based</td>
<td>5 (22.7)</td>
<td>4 (36.4)</td>
</tr>
<tr>
<td>Body-based</td>
<td>3 (13.6)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Country where conducted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US</td>
<td>7 (31.8)</td>
<td>4 (36.4)</td>
</tr>
<tr>
<td>Asia</td>
<td>10 (45.5)</td>
<td>1 (9.1)</td>
</tr>
<tr>
<td>Europe</td>
<td>4 (18.2)</td>
<td>4 (36.4)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (4.5)</td>
<td>2 (18.2)</td>
</tr>
<tr>
<td>Target symptom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression and/or anxiety</td>
<td>9 (40.9)</td>
<td>7 (63.6)</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>13 (59.1)</td>
<td>4 (36.4)</td>
</tr>
</tbody>
</table>
Results: General Study Limitations

- Sample sizes remained generally small enough to engender significant risks of type II errors. This may be especially true of studies that enrolled less symptomatic participants.
- Very few studies used systematic psychiatric diagnoses, and many even failed to specify symptom thresholds for inclusion.
- Dropouts were generally poorly accounted for, and few studies implemented intent-to-treat data analysis.
Results: General Study Limitations

- Many studies failed to provide enough details about inclusion/exclusion criteria and/or treatment protocols to allow for reliable replication.
- Despite the frequent assertion that CAM interventions are superior to conventional treatments in tolerability, assessments of adherence and side effects were overall poor.
- Lastly, control conditions had significant limitations, including several trials with wait-list or treatment as usual groups.
Results: Depression

- Loving et al. (2005a): Adults age 60-79 with significant unipolar depressive symptoms {US} [n=81] (x age=68)
- Treatment: Bright white light therapy 8500 lux for 1 hr in morning or evening at 18” distance daily x 4 weeks
- Control: Dim (<10 lux) red light with same parameters otherwise
- Measures: GDS, HAMD-17, sleep log, actigraphy
- RESULTS: Negative: bright white = dim red light
- Established threshold of depression severity for entry; excluded those with high natural light exposure; used partial sleep deprivation in all subjects on initial night of trial (with poor compliance rates); systematic assessment for adverse effects; innovative assessment of expectancy differences between active treatment and placebo; trend for better response in those not taking antidepressant during trial
Other studies of interest

- Manjunath & Telles (2005): Institutionalized adults age 60+ {India} [n=69] (x age = 71)

- Treatments:
  1. Yoga 75 minutes/day (?group), 6 days/week x 6 months
  2. Ayurvedic medicine: 10 g Rasayana Kalpa bid (combination of 5 herbs)

- Control: 1- 2- Wait list

- Measure: “sleep questionnaire”

- Positive (yoga > other 2 groups)

- Total “dose” of yoga quite high and possibly impractical for widespread use; no control for group effect; inadequately validated outcome measure
Other studies of interest

- Harrer et al. (1999): Adults age 60-80 with ICD mild-to-moderate depressive disorder {Germany} [n=149] (x age=69)
- **Treatment**: St. John’s wort 400 mg LoHyp-57 extract bid x 6 weeks
- **Control**: Fluoxetine 10 mg bid
- **Measures**: Zung SDS, HAMD-17, CGI
- **RESULTS**: Positive: St. John’s wort = fluoxetine
- Multi-center trial with relatively large sample size; systematic side effect reporting; authors’ assertions of superiority of St. John’s wort over SSRI’s in tolerability and drug interactions not supported by their own study; no discussion of dosing considerations in older adults compared to younger adults
Other studies of interest

- Li et al. (1994): Adults with a Traditional Chinese medicine diagnosis of “post-wind stroke depression” {China} \( n=101 \) (x age=63)
  - **Treatment**: Xingnao-Jieyu (“mind-refreshing anti-depressive”) acupuncture (XJA) Specified meridians for 30 mins daily x 45 days
  - **Controls**: 1-routine acupuncture (RAP) 2-doxepin 25 mg bid or tid + routine acupuncture (RAP)
  - **Measures**: CES-D (modified)
  - **RESULTS**: Positive: XJA = doxepin + RAP > RAP alone
  - Use of TCM diagnosis for inclusion makes results more authentic but also difficult to apply to Western medicine; little detail about treatment providers, standardization of treatments, statistical design, or duration of treatment; dosing of doxepin is low; control without any acupuncture intervention might have been more informative
Trial of electroacupuncture for depression (Mulsant et al 2009)

- RCT – N=50 (compared to sham tx)
- Age 18-80
- Psychotropics were tapered off

- Exclusion:
  - Suicidal ideation
  - Seizure disorder
  - Bipolar disorder
  - Psychosis
  - Substance abuse
Background

Recent reviews\textsuperscript{2, 3}:

- Studies in China: acupuncture/Electro-Acupuncture (EA) \textgreater\textless\textgreater amitryptiline (150-400mg/d)
- US study\textsuperscript{4}: remission rates similar on AC or placebo
- German study\textsuperscript{5}: improvement when AC was added to mianserin

Research Method and Design

- 12 sessions of EA (2/week) – each lasting 30 min

- Main outcome = relative change in 17-HRSD two weeks after completion of the intervention
## Demographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Electroacupuncture</th>
<th>Sham Electroacupuncture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age – Mean (SD)</td>
<td>46.2 (11.7)</td>
<td>48.8 (13.1)</td>
</tr>
<tr>
<td>Race – Caucasian (N)</td>
<td>21/24</td>
<td>25/26</td>
</tr>
<tr>
<td>Gender – Female (N)</td>
<td>21/24</td>
<td>18/26</td>
</tr>
<tr>
<td>Years of Education – Mean (SD)</td>
<td>15.1 (2.1)</td>
<td>15.9 (3.1)</td>
</tr>
<tr>
<td>Baseline HDRS – Mean (SD)</td>
<td>17.5 (3.7)</td>
<td>18.3 (3.6)</td>
</tr>
</tbody>
</table>
Results

- 24 subjects EA: HDRS 47% mean decrease
- 26 subjects SA: HDRS 48% mean decrease
- No adverse reactions associated with the intervention
Results
Results
Conclusions

- EA is well tolerated
- No differences between verum and sham EA after 6 weeks of treatment
- No differences at any time point
Complementary use of Tai-Chi to improve clinical outcomes in geriatric depression (in collaboration with Cousins Center)

- Tai-Chi is a mind-body interventions combining relaxation with exercise enhancing self-awareness beneficial in the elderly (balance, wellbeing, insomnia)
- 16 week trial in 74 partial responders to escitalopram (LEXAPRO) after 4-6 weeks of tx with additional 10 weeks of classes
- Randomized to receive Tai-Chi versus Health Education for 10 weeks
- Outcomes – depression, anxiety, resilience, apathy, physical and mental functioning, stress hormones, cytokines, cognitive assessment
One year until completion

- 59 recruited and 38 completed (21 in Tai Chi group and 17 in HE)
- **Difficult Issues:** Tai Chi - difficult to learn, not everybody “gets it,” have to be well enough to do it
- **Complementary use** in addition to an antidepressant escitalopram means smaller margin of additional improvement over and above
- **Social support of HE group** may be as or more important to isolated older adults than exercise
<table>
<thead>
<tr>
<th>Variables</th>
<th>Tai-Chi (31)</th>
<th>HE (27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>68 (7.7)</td>
<td>70.4 (7.4)</td>
</tr>
<tr>
<td>HAM-D base</td>
<td>15.7 (3.0)</td>
<td>15.7 (3.2)</td>
</tr>
<tr>
<td>Resilience</td>
<td>54.2 (14.5)</td>
<td>60.6 (13)</td>
</tr>
<tr>
<td>Apathy</td>
<td>32.8 (7.6)</td>
<td>35.6 (8.2)</td>
</tr>
<tr>
<td>Vascular burden</td>
<td>10.1 (4.9)</td>
<td>11.4 (5.3)</td>
</tr>
<tr>
<td>CIRS</td>
<td>5.2 (3.1)</td>
<td>6.5 (3.4)</td>
</tr>
<tr>
<td>HAM-a</td>
<td>9.5 (2.9)</td>
<td>8.9 (3.2)</td>
</tr>
</tbody>
</table>
HAM-D scores

TC
HE
Other outcomes

Bar charts showing different outcomes for TC and HE categories. The x-axis represents the categories (TC, HE), and the y-axis represents the value range from 0 to 70.

- Resilience base
- Resilience 16
- HAMA energybase
- energy16
Cytokines to Outcomes

12 subjects (6 in each group) - matched by age and gender (3 men and 3 women)

Had three-time points - baseline, week 6 and 16

CRP and IL6r - no effect on main outcome

Change in Il6r at week 16 correlated with HAM-A score (0.6); SF-36 change in role physical measure (r=0.6), but also wellbeing (0.4); phys fx (0.3)
What have I learned so far?

■ Western medicine approach- average medicine – “each treatment works for all”- **WRONG**!

■ Any contrast that has enhanced social support is likely to be as or more effective then any exercise!

■ What would be another effective control- drug alone versus another exercise

■ Exercise can exacerbate inflammation due to arthritis in older adults
Daily Meditation in Family Dementia Caregiver to Reduce Stress and Improving Cognition

- Collaborators:
  - Mike Irwin and Cousins Center
  - Sponsored by the Alzheimer’s Research Prevention Foundation
Advantages of Caregiver Model

- Limits the impact of medical burden, cognitive impairment and disability
- 50% have depression but 50% don’t
- Allows analysis of genetic predisposition (sib-pairs), personality, cognitive, emotional processing, neurobiology, stress responsivity
- Gene-environment and stress-vulnerability models
- RESILIENCE TO STRESS
- PREVENTIVE INTERVENTIONS
Epidemiology and Burden of Dementia and AD

United States

- Currently: 5 million people have dementia \(^1,^2\)
- By 2050: an estimated 16 million people will have dementia \(^1,^2\)
- 5 mln family caregivers
- 73% elderly caregivers and >70% are women
- 38% provide care for over 5 years
- Mortality is 60% higher than in noncaregivers

Informal caregivers

- Family members who provide extraordinary uncompensated care, predominantly in home settings, requiring significant amounts of time and energy for months and years, requiring the performance of tasks that are physically, emotionally, socially, or financially demanding.
Other Caregiver Issues

- Rate of depression as high as 50% in primary caregivers of demented patients
- **Physical illness and burnout** are common (metabolic syndrome and obesity, Allostatic Load, heart disease, mortality)
- **Psychological Reactions:** Denial; Anger; Social withdrawal; Anxiety; Depression; Exhaustion; Insomnia; Irritability; Poor memory and concentration
Allostatic Load = the price of adaptation to stress and aging

- **ALLOSTASIS** = maintaining stability through change (Sterling & Eiler 1988)
- Systolic BP (≥ 148 mm Hg)
- Diastolic BP (≥ 83 mm Hg)
- Waist-hip ratio (≥ 0.94)
- Ratio total cholesterol/HDL (≥ 5.9)
- Glycosylated hemoglobin (≥ 7.1%)
- Urinary CORTISOL (≥ 25.7 ug/g creatinine)
- Urinary NOREPINEPHRINE (≥ 48 ug/g creatinine)
- Urinary EPINEPHRINE (≥ 5 ug/g creatinine)
- High Density Lipoprotein cholesterol (< 37 mg/dl)
- Dihydroepiandrosterone sulfate (DHEA-S) (< 350 ng/ml)

Seeman TE et al Proc Natl Acad Scie 2001 McEwen 2004
(McArthur Study of Successful Aging)
Outcomes of caregiving

**Negative:**
- Stress of caregiving causes stress in other areas of life:
  - Poor physical and mental health
  - Higher use of psychiatric medications

**Positive influence:**
- Emotional support from family and friends
- Self-confidence, and resources to help with household chores all were found to positively influence caregivers and protect against stress.

**50% ARE NOT DEPRESSED!**
Innate characteristics
- Age, sex, race, Genetic (5-HTTLPR; IL-6 genes)
- Personality/affective style
- Resilience

Intermediate phenotypes
- Emotional processing
- Negative ruminations (fMRI)
- Amygdala
- Subgenual Cingulate
- Il-6, cytokines, cortisol, DHEA

Phenotypes
1. Depression / No Depression
2. Resilience

STRESSORS
Patient characteristics - stage of dementia, problem behaviors
Caregiver characteristics
- Time in caregiving, losses
The stress/health model applied to caregiving and related interventions

Stress/Health process

Primary stressors
- Care recipient disability
- Problem Behaviors Losses

Secondary stressors;
- Family or work problems

Appraisals of demands and adaptation

Perceived stress

Emotional response

Morbidity/Mortality

INTERVENTIONS
- Family counseling
- Social Support
- Psychoeducation/communication
- Skills training
- Self-care prevention

No meditation studies are available

Schulz, & Martire 2004
Caregiver trial

- 8-week randomized to receive yogic kriya/meditation versus listening to relaxation tapes
- Depression, resilience, distress, burden, quality of life
- Stress hormones and proinflammatory cytokines; microarrays
- HAM-D scores range 6-15
STRESS vs RESILIENCE

↑AGE = lower resilience; increased vascular and medical burden; lower physical functioning

↑YRS of CAREGIVING = increased vascular and medical burden; severity of depression; poor general health

↓RESILIENCE = increased chronicity and severity of distress
CONCLUSION

- CAM use is most likely useful for prevention of late-life mood and cognitive disorders
- More studies are needed
- Individualized approach and the use of Western and Eastern measures of outcome are necessary to discern the benefit

WHAT IS THE IDEAL DESIGN?