Understanding the mechanisms of yoga with intervention components

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Yoga therapy is the process of empowering individuals to progress toward improved health and well-being through the application of the teachings and practices of Yoga.” - IAYT Definition

Initial goal of yoga research - build an evidence base
Yoga studied as a treatment for

- ADHD, anxiety, arthritis, asthma, back pain, cancer, depression, diabetes, epilepsy, GERD, heart disease, HIV, hypertension, MS, obesity, PTSD, RA, schizophrenia, scoliosis, sexual disorders, substance use, etc.

- May improve depression, anxiety, stress, sleep, pain, fatigue, physical function, sexual function, hypertension, blood glucose, memory, QOL, health care costs, satisfaction, etc.

- Preventively with older adults, children, babies, pregnant women, police/firemen, and athletes to prevent injury, slow aging, improve cognition, etc.

- It seems to work, so now we want to know why
“Understanding the mechanisms ...mind/body interventions exert their clinical effects is critical for the development of optimized interventions that target specific conditions and disorders.” — NCCIH RFA-AT-16-005

Mechanisms = processes (physiological, psychological) or mediators through which therapeutic change occurs — Kazdin & Nock, 2003
SKY yoga reduced depression more than control intervention, reduction in BDI was correlated with reductions in cortisol (Vedamurthachar A, et al. J Affect Disord. 2006)

For yoga, 36% of the effect on 12-week RMDQ was mediated by increased self-efficacy, 18% by sleep disturbance, 9% by hours of yoga practiced (Sherman et al. 2013)
Riley & Park, 2015 - systematic review of change mechanisms of yoga for stress reduction - mediation analyses

- 926 total studies, 71 mechanistic
- many potential mechanisms
- 5 studies covering 7 mechanisms were chosen for analysis
- Psychological - positive affect and self-compassion
- Biological - hypothalamic activity and salivary cortisol
more weeks of yoga practice in last year, more lifetime yoga sessions, and more years of yoga were all significantly associated with lower leptin - (Kiecolt-Glaser, et al. 2012)

- Women who experienced more stressors involving interpersonal tension had higher ghrelin and lower leptin levels (Jaremka, et al. 2014)

African dance and yoga reduced stress and negative affect. Only AD had improved positive affect. Cortisol went up in AD and down in yoga. (West et al. 2004)
Limitations

Most mechanistic studies look at mediators
Few connect outcomes or mediators to dose of yoga
Rarely are outcomes or mediators linked to the components of yoga
Yoga is multidimensional, not one thing
What intervention components are responsible for changes?
Yoga is Multidimensional

- Breath Work
- Meditation
- Concentration
- Challenging Asana
- Relaxing Asana
- Ethical Principals
- Mindfulness

Physiological Processes

Psychological Processes

Mental Health

Physical Health
Schmalzl et al. (under review)

- compares hatha yoga consisting of movement sequences and postures, breathing, and focused attention to pranayama (breathing and focused attention)
- measured salivary cortisol, perceived stress, and sustained attention
- both groups showed reduced stress and salivary cortisol after the program,
- only the breath-focused group showed improvements in sustained attention
- Improved attention was correlated with stress reductions but not with reduced cortisol
Yoga study design

R34 - Yoga for CLBP and CNP in active duty military compares

- hatha yoga (postures, breath, attention, ...)
- to a more restorative style of yoga
- Measuring pain, physical function and fatigue, as well as perceived stress, mood,
- Are there differences in attendance, retention, satisfaction, and outcomes?
Essential Properties of Yoga Questionnaire

Purpose: to quantify and describe the essential dimensions present in yoga interventions.

Meant to be used by objective raters.

All items are preceded by the question stem:

HOW MUCH did the instructor mention or include…”

...placing one’s focus on the breath?
...modifications to make a pose easier?
...meditation during the session?
PYQ - 14 Factors Identified

1. Physicality
2. Health Benefits
3. Acceptance/Compassion
4. Meditation/Mindfulness
5. Mental & Emotional Awareness / Release
6. Yoga Philosophy
7. Spirituality
8. Breathwork
9. Body Awareness
10. Body Locks (Bandhas)
11. Postures (Asanas) - Restorative
12. Individual Attention
13. Postures (Asanas) - Active
14. Social Aspects
Using the EPYQ

EPYQ rates whole interventions, not designed to be used by yoga students/practitioners.

More qualitative analyses where we can see that certain types of yoga are producing certain effects.

By building a database of EPYQ ratings and related outcomes, meta-analysis can be used to link yoga components to mediators and outcomes, thereby getting at mechanisms.
Conclusions

Mediational analyses often do not connect the mediator or outcome to actual yoga components, or dose of yoga.

Choice of comparison group and study design is important for getting intervention components.

EPYQ helps describe the yoga intervention components and can eventually be linked to study outcomes.
Thank You!