

EDITORIAL

Minding the Mat: Moving the Yoga Field Forward

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Importancia de la esterilla: Progreso en el ámbito del yoga

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In this issue of *Global Advances in Health and Medicine*, Cheung et al report their findings from a mixed-methods study of adherence to yoga practice for older women with knee osteoarthritis.¹ These women completed an 8-week yoga intervention for osteoarthritis 6 months prior

to completing a survey, face-to-face interviews, and videotaping of their practice. Adherence at 6 months was analyzed 3 different ways to determine (1) whether the participant was practicing any yoga (yes/no); (2) average minutes of yoga practice per day; and (3) average days of yoga practice per week. Sixty-one percent of participants reported continuing to practice at least some yoga. Practicing yoga on average 21 to 30 minutes per day was most common (32% of participants). Almost half reported doing yoga 3 to 4 days per week. Qualitative analyses of interview data explored facilitators and barriers to ongoing yoga practice. Facilitators included perceived physical and mental benefits of yoga (eg, less pain and greater calmness, respectively) and setting aside a specific time for practice. Barriers included other health problems interfering with yoga practice, pain, and difficulty finding the time.

Yoga research like this study is timely. In 10 years, use of yoga by the public has grown almost 2-fold: In 2002, 5.1% of US adults used yoga at least once in the previous year compared to 9.5% in 2012.² Correspondingly, yoga research has increased substantially. A Medline search using the term *yoga* found 57 entries in 2002 and 400 entries in 2014. Randomized controlled trials have been conducted or are in process for common chronic conditions such as osteoarthritis, low back pain, anxiety, and depression. Fair to good evidence is emerging that yoga may be moderately effective for some conditions, particularly chronic pain.^{3,4} Terms such as *yoga therapy*, *therapeutic yoga*, and *medical yoga* are becoming more common. As yoga experts, researchers, and healthcare providers try to better understand what yoga is helpful for, the issue of assuring adherence to yoga practice becomes critical.

Adherence to a daily medication and specified dosage regimen is a straightforward concept, albeit with its own challenges to measure. For example, a person with high blood pressure adheres to his medication regimen by taking his antihypertensive pills daily as instructed. This definition presumes that the maximum beneficial effect of the hypertension medicine

will occur if the participant is adherent to taking it daily at the specified dose. For yoga and medical conditions, the same principles apply. However, we usually know little or nothing about the optimal dose and frequency of yoga.⁵ In turn, definitions of adherence become somewhat arbitrary. How do we define dose for yoga, and moreover, define and measure someone's adherence to the dose?

Yoga is a complex, multicomponent behavioral intervention. Yoga practice may comprise any or all of the following in varying proportions: postures (*asanas*), breathing exercises (*pranayama*), meditation (*dharana*), and ethical principles (*yamas* and *niyamas*). Furthermore, the variability of practice is large given the many yoga styles derived from different schools, instructors, and yoga lineages. Given yoga's heterogeneity, researchers have often used expert consensus to design standardized reproducible yoga treatment protocols. The protocols are usually delivered through classes and home practice. Many variables contribute to yoga "dose," including the length of each class, frequency of classes, and duration of the overall intervention period. These are usually predefined and can be easily measured through participant class attendance. However, ensuring that the instructors are delivering the protocol with fidelity is also important. The pharmaceutical equivalent to this would be "quality control"—for example, ensuring that the 25 mg blood pressure tablets labeled as metoprolol contain just that. To accomplish this with yoga, researchers often observe classes, either in person or through videos, and use a checklist approach to assess whether the recommended flow of the class, including sequences of asanas, was followed.

Home practice likely also plays an important role in overall dose. Typically, home practice is recommended and facilitated by handouts, audio CDs, or DVDs. Adherence to home practice is often assessed through self-report logs. The participant keeps a record of when and for how long he or she did yoga. Although self-report logs have been shown to be reasonably reliable, they are still subject to multiple forms of bias. In addition, logs cannot record yoga micropractices, such as taking a deep yogic breath while running late in traffic or a 30-second yoga stretch between long bouts of sedentary computer work. Other limitations of home practice logs include typically not capturing the specific components of yoga practiced. In this regard, Cheung and colleagues' video assessment of the participants is



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novel. Attempting to assess how well participants are practicing the protocol in class and at home—namely the fidelity of the participant to the protocol—and whether that is related to outcome has not been done in clinical trials.

Even if the dose of yoga can be reliably measured, how short- and long-term adherence to the dose can be encouraged is challenging but critical. Using mixed methods is an excellent approach to identifying facilitators and barriers to practice. These will likely vary according to the population and condition. Challenges facing older white women with osteoarthritis will be different than those facing young black postpartum mothers, sedentary office workers, individuals with morbid obesity, or male veterans with pain and posttraumatic stress disorder. Only after understanding facilitators and barriers can patient-centered approaches to address them and enhance adherence be developed.

Future yoga research will need to dive deeper into measuring and optimizing dose and ultimately enhancing adherence to that dose. Studies that parse out the relative helpfulness of different components of a yoga protocol can help. Methodologies drawn from engineering, such as multiphase optimization strategy (MOST), which uses factorial experimental designs that efficiently estimate effects and interactions between different components of a behavioral intervention, may be particularly helpful.⁶ Adapting wearable technology or specially designed yoga mats can be developed and tested to more accurately measure home

practice. Nonintrusive methods to assess instructor and participant fidelity to the protocol are needed. Using mixed quantitative and qualitative methodologies to understand population-specific facilitators and obstacles participants face in adhering to yoga practice will be essential to develop and test different strategies for facilitating long-term practice. Flexible scheduled drop-in or booster classes, online yoga, and workplace yoga are possible options to explore.

Yoga research is a relatively new field that shows promise but needs to mature. For yoga's potential as a therapeutic modality to be fully developed and realized, understanding, measuring, and ultimately enhancing the effective "dose" and adherence to that dose is needed.

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