Guest Editorial

Toward building evidence for yoga

Ayurveda and later the World Health Organization defined health that includes both physical and mental well-being. Ayurveda also brings in the spiritual dimension. Yoga as a lifestyle will allow us to enjoy the best of health as we transcend into better spiritual health.[1] Understandably, scientists who have developed tools to measure health have used the same tools to corroborate the role of Yoga. Positive effects of Yoga on health are endorsed by its illness-alleviation effects, Yoga therapy. If Yoga has to be prescribed for these roles, improvement in health or reduction of disease, present standards demand best evidence-base. Hence, the protagonists of Yoga have taken up the task of building evidence. Trials are conducted in healthy as well as diseased subjects examining the effects of Yoga. These effects encompass mere experiences of the subjects, assessments by researchers and laboratory tests. The latter include biochemical, physiological, neuroimaging and even genetic tests. The required research rigor such as randomization, blinding and using appropriate controls still remain a challenge in Yoga research. These make the evidence-building for Yoga an uphill task.

The strength of evidence varies from study to study. Case reports offer initial support for Yoga application for a required effect. Ebnezar *et al*.,[2] used a Yoga module in a patient who had already undergone total knee replacement and was advised bilateral hip replacement. There were substantial benefits experienced by the subject after Yoga intervention. Authors opined that Yoga must be offered before options such as joint replacement are considered. Cross-sectional data looking at differences between Yoga practitioners and matched subjects who did not practice Yoga is the next higher level of research to build evidence. For example, Infante *et al*.,[3] in their short communication found a better immune status in those who were practicing meditation than control subjects. Likewise, Vinchurkar *et al*.,[4] found mindfulness was better in the long term meditators than non-meditators. Attribution of the researched effect to Yoga is difficult in such studies. Both types of researches (case reports and cross-sectional) provide a lead for the potential effects of Yoga and hence are useful. In the case reports one gets insight into the applicability as well as feasibility of Yoga in a given condition. This may also provide some insight into possible side-effects, if any, of Yoga. It is equally important to be sensitive to reportage of any adverse events following the introduction of Yoga. In this issue too, Holton and Barry[5] report the consequences of experiencing adverse events following Yoga from a survey. It is reassuring to note that the adverse events are rare and does not form a barrier to Yoga practice. Whether the same is applicable to Yoga therapy in patients with different illnesses is useful information to the clinicians prescribing Yoga. Just as attribution to Yoga cannot be inferred to beneficial effects from cross-sectional studies, yoga causing adverse events too cannot be definitively inferred. Recording of adverse events helps in taking precautions when advising Yoga in select disease conditions.

Prospective designs with a control group/condition are hence desirable. In their study Bhavanani *et al*.,[6] compared the effects on hypertension of different yogic practices. Such a research has value in optimizing Yoga practices to obtain a desirable effect, particularly in therapy. Randomized trials on the other hand possess even greater strength. Attribution to Yoga for the effects studied is more definitive. Mooventhan and Khode[7] compared Bhramari pranayama with a controlled condition of not doing pranayama in a randomized prospective design. They found that pulmonary functions were better in those who practiced Bhramari. Similarly, Talwadkar *et al*.,[8] conducted a randomized controlled study in elderly and studied the effects of Trataka in comparison to wait listing. Neuropsychological test performance in Trataka group was better after exposure. In Yoga research, randomization and choice of controlled condition are both challenges, more so in the clinical situation when one applies Yoga for therapy as an add-on or as a sole agent. Yoga being a "time-tested" practice, subjects ask with a surprise why this should be tested again/now. This 'surprise' could lower the consent rates in addition to other barriers for Yoga.[9] In a recent study on schizophrenia comparing add-on Yoga with exercise or wait list, the researcher had to contact over 1000 patients to be able to obtain consent from just over 100 patients.[10]

In several of the measures used to study the effects of Yoga there can be a rater or subject bias. For example, reporting of severity of pain, depression, etc., can be influenced. Hence the trials demand blinding of the rater, the subject and the laboratories as well. In clinical drug trials therefore, identical-looking capsules/tablets are used in place the

Access this article online	
Website: www.ijoy.org.in	Quick Response Code
DOI: 10.4103/0973-6131.133868	

control condition. Patients/experimental subjects as well as the assessing doctors will hence be blind to intervention. Hence the reporting of effects remains objective. Blinding minimizes placebo effect. Blinding in studies of Yoga is even more difficult. The closest that has been possible is use of exercise as a control to Yoga asanas.[10] Still, there is no guarantee that blinding would occur. Alternatively an outcome parameter has to be chosen that is least likely to be influenced by the placebo effect. Such a parameter will also be free of "rater-bias". Some examples include a structural measure of an organ (brain) in imaging, changes in the gene or its expression etc., With advances in molecular biology and related technology, it is likely scientists could unravel basic mechanisms of Yoga and produce more robust evidence of effects of Yoga as desired by modern clinicians.

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How to cite this article: Gangadhar BN. Toward building evidence for yoga. Int J Yoga 2014;7:87-8.

Source of Support: Nil, **Conflict of Interest:** None declared.