



Is less more? A randomized comparison of home practice time in a mind-body program



Jonathan Greenberg^{a,b,*}, Tosca D. Braun^c, Marissa L. Schneider^a, Lucy Finkelstein-Fox^c,
Lisa A. Conboy^{b,d}, Elizabeth D. Schifano^e, Crystal Park^c, Sara W. Lazar^{a,b}

^a Department of Psychiatry, Massachusetts General Hospital, USA

^b Harvard Medical School, USA

^c Department of Psychological Sciences, University of Connecticut, USA

^d Beth Israel Deaconess Medical Center, USA

^e Department of Statistics, University of Connecticut, USA

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ABSTRACT

Home practice is a major component of mind-body programs, yet little is known about how to optimize the amount of prescribed home practice in order to achieve an effective “dose” of practice while minimizing participant burden. This study tested how varying the amount of home practice in a mind-body program impacts compliance and stress reduction, and whether prescribing a flexible home practice schedule increases compliance. Eighty-four stressed participants undergoing a 12-week yoga program were randomized to low, medium, and high home practice conditions. The medium condition allowed participants the flexibility to choose one of two amounts of practice each day. The low practice group exhibited the highest compliance (91%) compared to the medium and low practice groups (~60%), but exhibited the lowest total practice time, and did not significantly reduce stress. The high practice group was the only group to achieve significant stress-reduction, which was maintained 12 weeks post program. Prescribing a flexible home practice schedule did not increase compliance. Results suggest that prescribing higher practice doses may maximize practice time and symptom reduction despite lower compliance.

1. Introduction

Yoga and meditation-based programs reduce stress and alleviate symptoms of a broad range of mental and physical ailments (Balasubramaniam, Telles, & Doraiswamy, 2013; Chiesa & Serretti, 2011). Prescribed daily home practice is commonly regarded as one of the key therapeutic elements of these programs and as essential for treatment benefit as exercise is for muscle growth (Kabat-Zinn, 1990). Home practice is often viewed within the framework of skill development which requires regular rehearsal for mastery and gaining the desired outcome (Parsons, Crane, Parsons, Fjorback, & Kuyken, 2017). Maximizing amount of home practice is thus a high priority in mind-body interventions (Crane et al., 2014). However, home practice may pose a burden on participants, and a compliance is highly variable (Parsons et al., 2017). Importantly, the relationship between amount of prescribed practice, the degree to which participants comply with their prescribed practice, and clinical outcome is currently unclear.

Many mind-body studies do not report the relationship between

home practice compliance and outcome (Carmody & Baer, 2009), and those which do have found mixed results (Vettese, Toneatto, Stea, & Wang, 2009). Some studies have found that amount of home practice is correlated with stress reduction (e.g. Davis, Fleming, Bonus, & Baker, 2007; Quach, Gibler, & Mano, 2017) and other clinical outcomes (e.g. Crane et al., 2014; Grow, Collins, Harrop, & Marlatt, 2015) while other studies have not (e.g. Cadmus-Bertram et al., 2013; Davidson & Kabat-Zinn, 2004; Speed-Andrews, Stevinson, Belanger, Mirus, & Courneya, 2010). A recent meta-analysis of Mindfulness-Based interventions (Parsons et al., 2017) found substantial heterogeneity in the amount of reported home practice, with a weak ($r = 0.26$) yet statistically significant association between self-reported home practice and outcome. However, the correlational/observational approach in these studies may be severely confounded by individual differences and other factors. A randomized examination of the effects of home practice is thus needed in order to determine the specific and causal role of home practice.

A specific strategy which may improve individuals' propensity to

* Corresponding author. 151 Merrimac street, 6th Floor room 624, Boston, MA, 02114, USA.

E-mail address: jgreenberg5@mg.harvard.edu (J. Greenberg).

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comply with a home practice regimen is increasing participants' sense of autonomy and personal choice. Autonomy can predispose individuals to comply with requests and instructions (Guéguen & Pascual, 2000), and is associated with interest, a positive emotional tone, and persistence in behavioral change (Deci & Ryan, 1987). Importantly, a sense of autonomy facilitates intrinsic (“want-to” rather than “have-to”) motivation, which involves action out of personal interest, excitement, enhances performance, and promotes goal attainment (Deci, 1975; Deci & Ryan, 1987). However, to our knowledge the effects of increasing individuals' sense of autonomy and personal choice on practice compliance has not been examined.

To disambiguate the relationships among prescribed amount of home practice, actual time spent practicing, compliance and outcome, we randomized participants enrolled in a yoga program to one of three amounts of prescribed home practice; low, medium, and high. Prescribed practice lengths were determined based on popular mind-body programs which commonly prescribe 40 min a day (e.g. Kabat-Zinn, 1990; Segal, Williams, & Teasdale, 2013) and other popular methods of practice such as the Headspace mobile app which rely on short 10-min practice sessions. The practice frequency of 6 days a week was similarly chosen in order to match the frequency prescribed in other popular mind-body interventions (Bowden, Gaudry, An, & Gruzelier, 2012; Kabat-Zinn, 1990; Raghuram, Deshpande, & Nagendra, 2008; Segal, Williams, & Teasdale, 2013a). We hypothesized that the low practice group (10 min per day) would have higher compliance than the high practice (40 min a day) and medium practice groups, but lowest total practice time. To test the potential effects of autonomy on compliance, the medium practice group contained a novel element of flexibility. This group was instructed to practice 10 min 3 days a week and 40 min 3 days a week, with the autonomy to choose which days to practice each amount in a way that best fits their needs. We hypothesized that this increased autonomy and flexibility would promote the highest amount of practice.

2. Methods

2.1. Participants and procedure

The study was part of a larger study examining the effects of yoga on health behaviors including diet and exercise, which will be reported elsewhere (Braun et al., in preparation). Recruitment began in April 2015 and follow-up assessments concluded in October 2016. Sample size was determined based on power calculations of the larger study dietary measures. Participants were recruited from two sites, the greater Boston Area and Eastern Connecticut via online advertisements for a stress reduction program, in public transit and direct mail advertisements. Potential participants completed a web survey and phone screen, followed by an in-person screening appointment where they provided written informed consent and completed the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1997), the Eating Disorders module from the Structured Clinical Interview (SCID), and a BMI assessment. Participants had to be between the ages of 23 and 67. Exclusion criteria, implemented as part of the larger study, included an exercise regimen of more than 180 min per week (based on Haskell et al., 2007), daily consumption of 5 or more servings of fruits and vegetables, current diagnosis of psychiatric illness as determined by the MINI and SCID eating disorder module, significant previous meditation/yoga experience (defined as ≥ 12 classes in last 3 years or more than 20 classes in lifetime), medications that alter appetite, and medical conditions that would limit the ability to exercise or do yoga. Following screening, 117 volunteers gave informed consent. Eighty-four participants were randomized. Participant flow and available data are detailed in Fig. 1. Participants received the program for free and were remunerated up to \$100 for completing study assessments. The study protocol was approved by the Institutional Review Boards (IRB) of Massachusetts General Hospital and the University of

Connecticut and monitored by Westat. The protocol is registered in Clinicaltrials.gov (NCT02098018).

Participants were randomized with equal allocation ratio into one of three groups (see Table 1) in blocks of 6 stratified by gender at each class site/location (Boston or Eastern Connecticut). The randomization list was generated via an algorithm on SealedEnvelope.com and imported into RedCap, where the randomization module was used to assign participants to groups. Randomization occurred after the first class in an effort to randomize participants who have shown enough commitment to show up for at least one class. Participants in the “low practice” group were instructed to practice 10 min a day 6 days a week, participants in the “medium” group were instructed to practice 40 min a day 3 days a week and 10 min a day 3 days a week, and participants in the “high practice” group were instructed to practice 40 min a day 6 days a week for the duration of the 12-week program. No differences were found between groups in age ($F(2,81) = 0.76, p = .47$), gender ($\chi^2(2) = 0.38, p = .83$), race ($\chi^2(6) = 1.83, p = .93$), or level of education ($\chi^2(4) = 1.05, p = .64$; Table 1). The perceived stress questionnaire was completed using RedCap and homework logs ($M = 8.28, SD = 3.85$ for study completers) were handed to an unblinded research assistant.

2.2. Stress reduction program

The 12-week Kripalu Yoga program was comprised of two segments: 1) an 8-week manualized protocol with 2-h weekly sessions that included 25–30 min of didactic content, 20–25 min of experiential exercises and 75–90 min of yoga practice, followed by 2) four weekly 90-min yoga classes without didactic content. The 8-week protocol was created and piloted by collaborators at the Kripalu Center for Yoga and Health, and modified for use with this population by the second author, a 200-h certified yoga therapist and 500-h certified Kripalu yoga teacher. The two-segment intervention design was implemented to give participants theoretical and applied grounding in important yogic practices and concepts before offering standard yoga classes.

Each session of the 8-week manualized protocol comprised a didactic section including group discussion (25–30 min), an experiential section in which participants practiced specific yogic techniques (20–25 min), and a full yoga class (75–90 min). Session themes were as follows: Introduction to Kripalu Yoga (Session 1), Witness Consciousness (a concept similar to mindfulness, Session 2), Finding Your Edge (avoiding over or under-efforting, Session 3), Breathe Relax Feel Watch Allow (BRFWA; a Kripalu-based stress reduction technique), BRFWA during Yoga (Session 4) and during daily life activities (Session 5); Self-Kindness (Session 6), Body Wisdom (listening to one's body, Session 7), and Autonomy (developing a home practice, Session 8). The remaining four weeks of classes comprised of 5–10 min of centering (e.g., meditation on the breath), posture warm-ups (10–20 min), standing posture flow including sun salutations (30–40 min), cool-down poses (10–20 min), and final relaxation (7–10 min).

2.3. Home practice and compliance

Participants were assigned daily home practice materials corresponding to the group to which they were randomized, including videos of appropriate length (10 min, 40 min, or both) demonstrating posture flows. Home practice and compliance for each week were assessed via a written log that participants turned in at the following week's class.

2.4. Self-reported stress

Stress levels were assessed through the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) at baseline, 8 weeks, 12 weeks (post-program), and 24 weeks (follow-up). The PSS is a 10-item scale designed to evaluate the extent to which one perceives situations in one's life as stressful. Participants are instructed to indicate how often

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