Research

The Essential Properties of Yoga Questionnaire (EPYQ): Psychometric Properties

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Abstract

Yoga interventions are heterogeneous and vary along multiple dimensions. These dimensions may affect mental and physical health outcomes in different ways or through different mechanisms. However, most studies of the effects of yoga on health do not adequately describe or quantify the components of the interventions being implemented. This lack of detail prevents researchers from making comparisons across studies and limits our understanding of the relative effects of different aspects of yoga interventions. To address this problem, we developed the Essential Properties of Yoga Questionnaire (EPYQ), which allows researchers to objectively characterize their interventions. We present here the reliability and validity data from the final phases of this measure-development project. Analyses identified fourteen key dimensions of yoga interventions measured by the EPYQ: acceptance/compassion, bandhas, body awareness, breathwork, instructor mention of health benefits, individual attention, meditation and mindfulness, mental and emotional awareness, physicality, active postures, restorative postures, social aspects, spirituality, and yoga philosophy. The EPYQ demonstrated good reliability, as assessed by internal consistency and test-retest reliability analysis, and evidence suggests that the EPYQ is a valid measure of multiple dimensions of yoga. The measure is ready for use by clinicians and researchers. Results indicate that, currently, trained objective raters should score interventions to avoid reference frame errors and potential rating bias, but alternative approaches may be developed. The EPYQ will allow researchers to link specific yoga dimensions to identifiable health outcomes and optimize the design of yoga interventions for specific conditions. *Park, Elwy, Maiya, et al. Int J Yoga Therapy 2018(28). doi: 10.17761/2018-00016R2.*

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Introduction

The practice of yoga for health promotion, prevention, intervention, and treatment is increasing in the United States. Rates of practice in the general population are also increasing: The proportion of the U.S. population who reported practicing yoga in the past 12 months rose significantly from 2002[1] to 2007,[2] and again in 2012,[3] from 5.1% to 6.1% and to 8.9%, respectively. Among people dealing with serious health issues, the percentage practicing yoga may be even greater.[2,4,5]

Yoga interventions are being developed, studied, and implemented to treat or manage a variety of health conditions. For some conditions, such as chronic low back pain, multiple randomized controlled trials (RCTs) have been conducted and systematic reviews have concluded that yoga is an effective treatment.[6,7] For many other conditions,

preliminary results suggest that yoga practice leads to symptom reduction, increased function, and improved quality of life, but conclusions are tentative until larger, more rigorous studies are conducted. These results are documented in more than 200 review studies of yoga for improving health outcomes among people with major health conditions including cardiovascular disease,[8,9] metabolic syndrome,[10] diabetes,[11] breast cancer,[12] multiple sclerosis,[13] depression and anxiety,[14] and asthma.[15]

Despite these promising findings, the content and substance of yoga remains a "black box" insofar as studies have yet to identify its active ingredients. Research in this area is nascent and consensus lacking regarding which components of yoga are present, should be present, or should be studied. Even within a single yoga style, tradition, or practice, what actually occurs in a given yoga class or intervention can vary widely. Although yoga has often been mischaracterized as simply calisthenics, the poses or postures *(asana)* comprise only one of eight limbs of a larger system of complete health and balance outlined in the Yoga Sutras. The other seven limbs, or disciplines, of yoga are *yamas* (ethical disciplines), *niyamas* (individual observances), *pranayama* (breath control), *pratyahara* (sense withdrawal), *dharana* (concentration), *dhyana* (meditation), and *samadhi* (self-realization, enlightenment). Yoga practices in the West usually fall under the umbrella of the Hatha Yoga tradition, which typically includes poses and breathing exercises combined with other classical yoga components, commonly mindfulness/meditation and/or concentration.[16] Yoga practices differ with respect to the emphasis they place on these and other dimensions, such as physical exertion, spiritual focus, teacher behaviors, and setting.[17] Although yoga styles differ, notable variations within any given style can also emerge as styles may be modified, reinterpreted, blended together, or adapted for a given health condition or population.

This heterogeneity and multidimensionality of yoga interventions make it difficult to determine which component, or combination of components, is responsible for the health outcomes obtained. Studies of yoga nearly always include some combination of the basic components of yoga described above (e.g., poses, breathwork, and meditation), but few reports detail the specific components of their yoga interventions. Furthermore, different yoga interventions, with varying emphases on different components of yoga, may have different effects on physiological stress responses, biomechanics, and other pathways through which yoga may influence health. A few researchers have attempted to address this shortcoming by comparing the effects of different yoga-based interventions,[18] but to be interpretable, even this approach requires methods for quantifying the intervention components.

To date, yoga interventionists lack robust and psychometrically valid tools to describe their interventions. In an extensive review of the literature, we were not able to locate a single study that systematically described or quantified the broader range of commonly used components of yoga interventions. Because yoga comprises many potential components, developing a valid measure for describing and quantifying the different aspects of yoga interventions is complex. The potential benefits of such a measure, however, are many: Researchers would be able to conduct replication studies, differentiate their programs from one another, and specify intervention components that can be linked to particular outcomes to modify and improve yoga interventions for specific health conditions.

This article reports the methods and process by which we developed a new measure to address current limitations in the yoga literature and to advance research on yoga—the Essential Properties of Yoga Questionnaire (EPYQ)—and presents the psychometric properties and factor structure of the final measure. We anticipate that the EPYQ will advance yoga research by providing a standard way to rate interventions, enabling comparisons of results across studies, assisting in the selection of comparison conditions, optimizing the mix of yoga dimensions in interventions, and aiding in identifying underlying mechanisms of action.[19] The tool will also allow researchers to link specific components of yoga to specific health outcomes such as changes in pain, depression, and functioning.

Methods

Project Overview

The EPYQ was systematically developed and tested as a quantitative measure of the primary components of yoga. The project was supported by the National Center for Complementary and Integrative Health and included a military supplement through which active-duty military personnel and veterans participated in phases III and IV.

In phase I, we sought to develop a comprehensive understanding of the relevant aspects of yoga interventions and to gather a large pool of potential questionnaire items by conducting a systematic scoping literature review and consulting focus groups of yoga teachers and students.[20] The goals of this literature review of yoga interventions were to determine the size and nature of the evidence base, and to identify gaps in the literature and recommend areas for future research. We conducted nine focus groups across the three study sites, with six to eight participants per group (n = 69). The focus groups were approximately 90-minute sessions led by a researcher trained in focus-group techniques. We analyzed focus-group transcripts using qualitative

methods to identify yoga teachers' and students' views of the essential elements of yoga interventions.

In phase II, we assembled a prototypic questionnaire from information gathered in phase I along with expert opinion from yoga researchers to generate items for further testing. Cognitive interviews were then conducted with these preliminary EPYQ items to assess the perceived clarity, meaning, and importance of each item. Cognitive interviews lasted approximately 2 hours with participants who were yoga instructors, yoga students, and researchers who practiced yoga and/or were involved in yoga research (n = 31).

In phase III, we administered the item pool to yoga students, instructors, and researchers using an online survey. We conducted exploratory and confirmatory factor analysis to identify factors, select the best items per factor, reduce the number of items in the measure, and confirm the factor structure. In phase IV, we established the psychometric properties of the questionnaire by testing the final instrument in the context of a series of diverse yoga interventions. A detailed overview of the project, methods used in all four phases, and preliminary results from phases I and II were published previously.[19] Consequently, this article focuses on the findings from phases III and IV.

For all phases, participants were required to be 18 years of age or older, be fluent in written and spoken English, and have participated in at least five yoga classes as either a student or instructor in the 2 months prior to research participation. All participants provided informed consent before participation. This study was approved by institutional review boards (IRBs) at each site.

Phase III

Phase III objectives were to: (1) field-test an online version of the EPYQ with yoga students and yoga instructors; and (2) examine underlying factor structure, reduce scale length by eliminating items, and finalize items for the instrument. Two samples were recruited for the study, one for exploratory factor analysis (sample 1) and one for confirmatory factor analysis (sample 2). Participants from the military supplement were added to the first sample, resulting in sample 1a (nonmilitary) and sample 1b (military) together comprising sample 1.

Participants and Recruitment

Participant demographics are shown in Table 1. Participants were recruited for sample 1a via targeted announcements and fliers at local yoga studios and other local community partners at each of the three sites. The initial goal of sample 1a was to recruit 400 participants who were yoga students, instructors, or researchers. Because the EPYQ was intended to be an appropriate tool for all types and styles of yoga, we sought to ensure that our sample represented a variety of

Table 1. Demographics of Participants in Phases III and IV

	Sample 1a (n = 481)	Sample 1b (n = 329)	Sample 2 (n = 491)	Phase IV (n = 144)
Age (y)				
18–25	8%	4%	3%	14%
26–35	23%	32%	22%	36%
36–45	21%	28%	21%	9%
46–55	24%	17%	25%	25%
56–65	20%	10%	24%	14%
> 65	4%	9%	5%	2%
Gender				
Female	90%	50%	92%	79%
Male	10%	50%	8%	21%
Ethnicity*				
American Indian or Alaskan Native	2%	4%	2%	1%
Asian	4%	4%	4%	6%
Black/ African American	3%	7%	2%	2%
Latino/ Hispanic	7%	7%	5%	10%
Native Hawaiian or Pacific Islander	0.5%	2%	1%	1%
White	90%	82%	91%	81%
Multiracial	2%	6%	3%	6%
Education				
High school diploma or equivalent	4%	5%	2%	7%
Some college	10%	17%	9%	11%
Associate's degree	7%	9%	6%	5%
Bachelor's degree	35%	37%	39%	48%
Graduate degree	44%	31%	44%	29%
Certified Yoga Instructors	49%	31%	99%	27%
Military Affiliation	3%	100%	3%	20%
Veterans	—	65%	—	—
Active duty	—	26%	—	—
Reserves	—	5%	—	—
National Guard	—	3%	—	—

*Percentages may add up to greater than 100, as participants were able to select multiple categories.

yoga styles practiced by diverse populations within all geographic regions across the United States. A list of 35 common styles of yoga was compiled, based on expert consensus: Ananda, Anti-Gravity, Anusara, Ashtanga, Bikram, Chair, Christian, Forrest, Hatha, Integral, Integral Science of Hatha and Tantric Arts, Iyengar, Jivamukti, Kali Ray Tri, Kripalu, Krishnamacharya, Kundalini, Laughter, Moksha, Power, Partner, Restorative, Sahaja, Silver Age, Sivananda, Sudarshan Kriya, Svaroopa, Tantric, Tibetan, Viniyoga, Vinyasa, Vivekananda, White Lotus, Yin, and Yoga Nidra. Sites specializing in at least one of these 35 styles of yoga were identified using a combination of search engines and directories including general Google search, Yoga Directory *(Yoga Journal)*, the Yoga Alliance directory, and Yoga Finder. We sought studios and centers that self-reported affiliation with a particular style of yoga. Classes had to be active and scheduled on a regular basis to demonstrate continuity and provide reasonable evidence of a community of practitioners. For each of the 35 styles of yoga listed above, three sites from different geographical regions across the United States, including every state, were selected for further contact; these 105 yoga studios were then sent recruitment emails and fliers with the survey link. We did not send follow-up emails to determine whether the studios elected to participate.

Recruitment for sample 1b consisted of U.S. active-duty military and veterans who met eligibility criteria. To meet the goal of recruiting 100 active-duty military and 100 veterans, several recruitment methods were used: word of mouth, posting recruitment fliers in yoga studios near military bases, Craigslist ads, Facebook announcements, military press advertising, Google searches of the terms "yoga for veterans" and "yoga for military" to identify yoga studios and instructors to contact to obtain a sample of active-duty military and veterans who practice yoga, and announcements in the national Yoga Alliance newsletter.

To recruit participants for sample 2 (confirmatory factor analysis), the Yoga Alliance agreed to announce the field-testing of the EPYQ to yoga instructors through their national and international newsletter. Our initial goal, prior to approval of the military supplement, was to recruit an additional 400 participants in sample 2 to conduct confirmatory factor analysis. Samples 1a and 1b were eventually combined after it was shown that the factor structure adequately fit the military sample (1b) as well. This resulted in sample sizes of 810 and 489 for the exploratory and confirmatory analyses, respectively (Table 1). Participation was international given the international nature of the Yoga Alliance membership.

EPYQ Item Pool

We administered the EPYQ item pool to samples 1 and 2 along with a brief demographic survey. The initial item pool consisted of 81 items in part 1 concerning components of yoga present in the last yoga session that respondents had attended (Tables 2 and 3); we did not administer part 2, which comprises 17 items that query factual information about the intervention design and the series of yoga sessions. The 81 items in part 1 of the EPYQ were all preceded by the question stem, "How much did the instructor mention or include . . . " This stem was chosen to help respondents focus on more tangible and observable aspects of the yoga intervention. Example items that follow this stem include " . . . placing one's focus on the breath?," " . . . vigorous activity or physical exertion?," and " . . . spiritual readings, quotes, sayings, teachings, or ideas?" Response categories for each question were on a 5-point Likert scale from 1 *(not at all)* to 5 *(a very large amount)*.

The 17 items in part 2 of the EPYQ included number and frequency of classes in the intervention, number of instructors present, instructor credentials and training, and information about the space in which the yoga was delivered (e.g., indoors or outdoors, in a heated or nonheated room, with or without music, in a studio or all-purpose space). These characteristics may be important elements in determining effects of yoga and should be reported by researchers in published work. These items will also help the EPYQ fulfill guidelines for reporting yoga interventions, as an extension to a current intervention-reporting checklist,[21] that are anticipated in 2018.

Procedure

Recruitment materials directed participants to a secure website that first asked them to consent to the survey. Participants who consented completed the EPYQ survey online and were then directed to click on another secure web link to provide a mailing address to receive compensation. This method ensured that participants' survey answers and identifying information were not linked. The full survey took approximately 15–20 minutes to complete. Participants in sample 1a were given $10 for completing the survey. Participants in sample 1b initially received $10, but the incentive was increased to $25, with IRB approval, to facilitate more rapid recruitment. For sample 2 (Yoga Alliance instructors), the Yoga Alliance offered to advertise our study to their membership without financial compensation, so all participants in this sample donated their time to the project.

Phase III Analyses

We conducted factor analysis to refine the items and scales for the final EPYQ measure. Prior to conducting the factor analyses, items were screened for data normality and sufficient variance. Participants needed to complete 80% of the

Table 2. EPYQ Items and Statistics from Phase III, *continued on next page*

EPYQ Item*	Factor Loading	Item Total Correlation	Mean	SD
Acceptance/Compassion (α = .884)				
Setting intentions or goals for the class	0.40	0.52	3.14	1.27
Acceptance of your body while doing yoga	0.69	0.76	3.57	1.20
General thoughts of gratitude, love, kindness, etc.	0.60	0.73	3.32	1.27
Self-compassion (kindness/warmth toward yourself)	0.74	0.83	3.26	1.32
Acceptance of things as they are	0.70	0.77	3.30	1.31
Breathwork (α = .821)				
Placing one's focus on the breath	0.73	0.73	3.88	1.06
Deep breathing (full inhalation and exhalation)	0.68	0.60	3.89	1.03
Linking breathing with movement	0.68	0.57	3.98	1.11
Instruction of a breathing technique (pranayama)	0.55	0.54	2.97	1.37
Instruction about why breathing is important	0.55	0.67	3.60	1.27
Physicality (α = .915)				
Physical balance	0.69	0.75	3.53	1.06
Physical flexibility	0.72	0.75	3.35	1.15
Physical strength	0.69	0.72	3.19	1.15
Vigorous activity or physical exertion	0.74	0.67	2.71	1.20
Being in constant motion (vinyasa or flow)	0.56	0.51	2.82	1.26
Challenging one's physical balance ("finding one's edge" in regard to physical balance)	0.77	0.80	3.28	1.22
Challenging one's physical flexibility ("finding one's edge" in regard to physical flexibility)	0.81	0.80	3.19	1.25
Challenging one's physical strength ("finding one's edge" in regard to physical strength)	0.82	0.81	3.11	1.26
Active Postures (Asanas) (α = .704)				
Alignment, form, and/or correct posture	0.46	0.50	3.91	1.05
Modifications to increase the difficulty of a pose	0.52	0.46	3.29	1.21
Holding poses (longer than a few seconds)	0.57	0.49	3.59	1.03
Inverted poses (poses where the head is below the heart or hips)	0.56	0.51	2.93	1.13
Restorative Postures (Asanas) (α = .774)				
Resting between poses	0.34	0.48	3.00	1.17
Modifications to make a pose easier	0.65	0.50	3.55	1.09
Recovery-type poses (poses used to rest or recover after more difficult poses)	0.62	0.71	3.19	1.15
Restorative yoga poses (totally supported/relaxing poses typically held for a longer period)	0.54	0.61	3.02	1.27
Savasana (corpse pose/the final resting pose)	0.50	0.46	3.95	0.99
Body Locks (Bandhas) (α = .802)				
Engaging muscles at the pelvic floor/region (mula bandha)	0.79	0.69	3.10	1.31
Engaging muscles at the core/abdominal region (uddiyana bandha)	0.76	0.68	3.55	1.16
Engaging jalandhara bandha (drawing chin back and lengthening the back of the neck)	0.67	0.59	2.74	1.35
Body Awareness (α = .804)				
Body awareness/paying attention to one's body	—	0.60	3.90	1.04
Asking students to concentrate on postural alignment	—	0.66	3.72	1.09
Asking students to concentrate on bodily sensations (e.g., lightness, softness, and muscle awareness)	—	0.71	3.52	1.20
Mental & Emotional Awareness/Release (α = .872)				
Allowing or being present to emotions or feelings that come up while doing yoga	0.69	0.74	3.36	1.28

Table 2. EPYQ Items and Statistics from Phase III, *continued*

EPYQ Item*	Factor Loading	Item Total Correlation	Mean	SD
Physical relaxation ("letting go" of physical tensions)	0.54	0.64	3.90	1.05
Mental relaxation ("letting go" of mental tensions, worries, or mental stress)	0.69	0.78	3.63	1.15
Emotional release ("letting go" of emotions)	0.77	0.82	3.30	1.33
Visualization or guided imagery	0.47	0.55	2.63	1.34
Health Benefits (α = .900)				
Physical health benefits of yoga	0.51	0.73	3.24	1.21
Emotional health benefits of yoga	0.47	0.85	3.07	1.33
Mental health benefits of yoga	0.45	0.82	2.95	1.33
Spiritual benefits of yoga	0.33	0.71	2.52	1.33
Individual Attention (α = .752)				
Giving individual attention or feedback (instructor or assistants)	0.69	0.58	3.28	1.21
Physically assisting students with poses (aligning, pressing, or stretching a student in a pose)	0.70	0.64	2.95	1.32
Physical support/adjustment of students during savasana (e.g., light facial massage, pressing shoulders, or pulling feet)	0.69	0.54	2.60	1.53
Social Aspects (α = .703)				
Partner Yoga (2+ persons connecting/touching in a posture)	0.54	0.41	1.34	0.81
Time for introductions or greetings	0.63	0.57	2.76	1.23
Teacher-facilitated social interaction during the session	0.71	0.63	2.38	1.29
Spirituality (α = .832)				
Chanting and/or reciting mantras or saying "om"	0.66	0.60	2.26	1.35
Spiritual readings, quotes, sayings, teachings, or ideas	0.54	0.71	2.37	1.30
Energy (prana, chakras, energy meridians, or nadis)	0.37	0.65	2.49	1.28
Reference to a connection to a higher power or something greater than oneself (Spirit, God, Universe)	0.46	0.70	2.02	1.22
Meditation & Mindfulness (α = .879)				
Quieting the mind	0.53	0.69	3.41	1.27
Mindfulness (nonjudgmental awareness of one's thoughts, feelings, or movements)	0.35	0.58	3.48	1.34
Meditation during the session	0.68	0.69	2.74	1.36
Meditation (dhyana: deep absorptive meditation)	0.76	0.74	2.30	1.35
Withdrawal of the senses (pratyahara: directing the attention from the external toward an internal awareness)	0.70	0.68	2.37	1.35
Concentration (dharana: a state of complete absorption or concentration/focus of the mind)	0.71	0.73	2.46	1.35
Yoga Philosophy (α = .851)				
Ethical principles (yamas: compassion, truthfulness, nonstealing, moderation, nongreediness)	—	0.76	2.17	1.35
Personal observances (niyamas: purity/cleanliness, diligence/focused effort, contentment, self-study, attuning oneself to the divine)	—	0.79	2.09	1.25
Union with the divine or "pure awareness" (samadhi)	—	0.69	1.90	1.24

*Scores on each item could range from 1 to 5.
SD = standard deviation.

Table 3. Items Removed from the Final EPYQ

Removed EPYQ Item	Scale(s)	Factor Loadings	Reason Removed
Healing from an emotional problem	Health Benefits	0.821	Highly correlated with related items in factor; expert opinion
Healing from a mental health problem	Health Benefits	0.786	Highly correlated with related items in factor; expert opinion
Healing from a physical health problem	Health Benefits	0.754	Highly correlated with related items in factor; expert opinion
Healing from a spiritual problem	Health Benefits	0.632	Highly correlated with related items in factor; expert opinion
Practicing yoga at home (doing the poses on your own)	Health Benefits	0.431	Expert opinion; conceptual fit; low loading
Asking students to concentrate on breathing	Breathwork	0.647	Highly correlated with related items in factor
Rhythmic breathing (breathing in and out at the same pace)	Breathwork	0.622	Expert opinion
Sending the breath to different parts of the body	Breathwork	0.527	Expert opinion; conceptual fit; low loading
Ujjayi breath (an audible breath with gentle constriction at the back of the throat)	Breathwork	0.426	Expert opinion; conceptual fit; low loading
Being peaceful	Acceptance/ Compassion	0.550	Expert opinion; conceptual fit; low loading
Using bolsters, pillows, and/or other props to modify poses	Postures, Restorative	0.476	Moved to EPYQ part 2
Anything related to spirituality or that was spiritual in nature	Spirituality	0.578	Highly correlated with related items in factor; low loading
Self-massage/self-touch	Social Aspects	0.670	Expert opinion; conceptual fit
Doing the poses along with the class (instructor or assistants)	N/A	N/A	Moved to EPYQ part 2
Modeling poses (instructor or assistants)	N/A	N/A	Moved to EPYQ part 2
Poses that focus on the upper body	Postures, Restorative; Physicality	0.529; 0.383	Cross-loading item
Poses that focus on the lower body	Postures, Restorative; Physicality	0.529; 0.354	Cross-loading item

items to be included in the analyses. First, exploratory factor analysis was conducted in SPSS with pooled data (n = 810) from samples 1a (n = 481) and 1b (n = 329). Scales were developed based on factor loadings from the exploratory factor analysis, reliability analysis of proposed scales, and expert opinion of the authors based on the originally hypothesized factor structure. A minimum factor loading of 0.3 was required, and items with loadings from 0.3–0.4 were closely evaluated for conceptual fit by experts.[22,23] The hypothesized domains and associated items were further examined with confirmatory factor analysis using the lavaan package in the R statistical platform,[24] Item Response Theory,[25] and Rasch analysis[26] with Winsteps.[27] Confirmatory factor analyses were conducted with sample 2 (n = 491). The factor structure was confirmed by measures of the quality of fit of the factor structure to the data, with a focus on testing the lack of fit gauged by the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR). It has been suggested that an RMSEA value of .07 or less[28] and an SRMR of .08 or less[29] indicate reasonable model fit. We also report the chi-square and the comparative fit index (CFI). Model fit was tested in the scale development sample (samples 1a and 1b, including separate fit of the military subsample) and the confirmatory sample (sample 2).

Phase IV

The objective of phase IV was to assess reliability and validity of the final EPYQ items and factors retained after phase III analyses. To this end, we examined internal consistency reliability, interrater reliability, test-retest reliability, concurrent validity, and discriminant validity.

Participants and Recruitment

Participant demographics are shown in Table 1. Recruitment was similar to earlier phases, primarily occurring

through announcements, fliers, and word of mouth at local community partner yoga studios/centers.

Procedure

Each of the three research sites hosted a set of 1-hour yoga classes at community partner facilities. The University of California San Diego site held three additional classes for military/veteran participants only. At each study site, efforts were made to offer a variety of different yoga styles using different instructors at varying locations. Styles included Ashtanga, Baptiste, Bikram, Forrest, Iyengar, Kripalu, Kundalini, Pranayama (military and nonmilitary), Restorative (military), Vinyasa Flow (military and nonmilitary), and Yin. Only research participants attended these single research session classes, but many participants were regular attendees at the studios where research yoga classes were held. The primary goal was to videorecord yoga classes to facilitate EYPQ ratings by trained expert raters at a later date. Although yoga students and yoga teachers completed demographic data and self-report questionnaires at all fifteen classes, they completed the EPYQ immediately after six of the fifteen classes. Completion of the 62-item EPYQ by students and instructors was an added burden to participants, and thus our focus was on obtaining objective ratings from trained raters.

Measures

Few existing measures are appropriate for assessing concurrent validity of the EPYQ considering the paucity of measure-development studies in the scientific yoga literature to date. However, we identified instruments that we expected to correlate with specific yoga components. We administered a standard demographics questionnaire and the State Mindfulness Scale (SMS)[30] prior to each yoga class. The SMS consists of twenty-one items regarding experience in the past hour (e.g., "I noticed emotions come and go" and "I felt aware of what was happening inside of me"). Items are rated from 1 *(not at all)* to 5 *(very well)*. Reliability and validity of the SMS are very good.[26] Immediately after the yoga classes, the SMS was readministered, along with the EPYQ, the Borg Rating of Perceived Exertion Scale, and the Therapist Warmth and Friendliness Subscale of the Vanderbilt Psychotherapy Process Scale (VPPS). The Borg Rating of Perceived Exertion Scale[31] is a single visual analog scale rating from 0 to 100 accompanied by eleven anchors that assessed the extent to which the participant found any activity (i.e., yoga class) physically taxing. The Borg scale has excellent psychometric properties. The Therapist Warmth and Friendliness Subscale of the VPPS[32] assesses a therapist's display of friendliness, warmth, and personal involvement, and we modified it to refer to the yoga instructor. The VPPS consists of five items (e.g., "Showed warmth and friendliness towards the student") rated from 1 (not at all) to 5 (very much). The VPPS exhibits strong psychometric properties in a variety of therapeutic settings.[33]

Video Rating Procedure

To train our staff in the use of the EPYQ, the team completed four individual practice ratings using publicly available 10- to 20-minute video clips of yoga classes in a variety of styles. Each staff member independently rated these videos using the EPYQ and a preliminary training manual that we developed and modified throughout the rating process. The study manager compiled results from each rater and calculated interrater reliability for each item. Items with low interrater reliability were reviewed on monthly team calls and reconciled to achieve greater agreement about the intended meaning of these items. Internal consistency was also calculated for each rater.

An initial version of the training manual was drafted using results from phase III and ongoing discussions among the study team. The team gradually clarified and refined the manual's instructions until a final version was agreed upon. Once the team reached a consensus on the manual, a group of five expert raters with the greatest internal consistency in the practice ratings was assembled. Each expert rater reviewed each of the fifteen recordings from the phase IV classes; these videos were viewed in full and rated using the EPYQ and training manual. Raters were instructed not to communicate with each other during this process to ensure that each person's ratings were based on his or her individual understanding of the EPYQ and training manual. Approximately 1 month after completing these initial ratings, the phase IV class videos were reviewed and rescored by four of the original five expert raters to calculate test-retest reliability. Each rater was assigned three or four of the videos to rescore during this process.

Analysis

Internal consistency reliability. To assess how well the scales identified in phase III tap into a single underlying construct, we computed Cronbach's alpha coefficients for each EPYQ scale.[34] We also computed corrected item-scale correlations for each EPYQ scale and the full scale.[35] A correlation of $r = .4$ has been deemed acceptable for supporting item internal consistency.[36]

Interrater agreement. We examined the interrater agreement of the EPYQ scores of each class video from four independent trained raters using intraclass correlation coefficients (ICCs). The ICC among multiple raters indicates the degree to which raters agree on the relative scores among scales across multiple videos.[37]

Test-retest reliability. To assess the stability of measurement over time, we conducted a test-retest reliability

substudy in which the trained raters independently rated three to four of the same videorecorded yoga sessions a second time, with 1 month separating the ratings, and with other sessions rated in between the repeat ratings. The test-retest reliability coefficient was computed following Magnusson's recommendations.[38]

External/concurrent validity. External/concurrent validity was assessed by comparing the EPYQ scores of expert raters with pre-post measures of outcomes that were expected to change as a result of the type of class participants completed. Measures assessing participants' personal experience (e.g., Mindfulness) and aspects of the yoga class (e.g., Teacher Warmth, Vigorousness) were administered during and immediately following each class. Concurrent validity was assessed by examining correlations between the EPYQ ratings for each phase IV class, with other questionnaires administered either before and after the class or immediately after the class.

Prior to holding the yoga research classes and collecting data, we selected measures that we hypothesized would correlate with the two process measures (Borg exertion and VPPS instructor warmth) and change score from the SMS (Mindfulness). We expected that EPYQ rater scores on the Physicality, Active Postures, and Bandhas scales would be related to higher scores of perceived exertion by students during the class, and that Restorative Postures would be negatively correlated with perceived exertion. Next, we expected that rater scores on the EPYQ scales of Acceptance and Compassion, Mental and Emotional Awareness/Release, Individual Attention, and Social Aspects would be positively correlated with VPPS scores (Teacher Warmth). Finally, we expected that the EPYQ scales of Meditation/Mindfulness, Acceptance and Compassion, Breathwork, Mental and Emotional Awareness/Release, and Body Awareness would be positively correlated with scores on the SMS (Mindfulness).

Discriminant/convergent validity. We examined the discriminant and convergent validity of the EPYQ dimension scales by comparing scores on the EPYQ scales across the different styles of yoga studied. Although there is high variability even within specific types of yoga, we expected that the EPYQ scales would reflect commonly expected differences between yoga types. For example, ratings of a Pranayama class would be expected to be high on Breathwork, and possibly low on Active Poses or Physicality, whereas ratings of a Bikram or Baptiste session would likely be high on the Active Poses and Physicality scales.

Exploratory analyses: Trained raters vs. student ratings. To examine the similarities and differences between trained raters and student ratings, students completed the EPYQ measure for six of the classes to assess the reliability of using student ratings to evaluate a yoga class or intervention. The averages of the standard deviations of the student scores within a given scale and class were also calculated and compared to those of the expert raters.

EPYQ Part 2

As mentioned above, the EPYQ has two parts. The fourteen scales are formed using the 61 questions from part 1. Part 2 consists of seventeen more factual and contextual questions about where the yoga was held (e.g., room temperature, presence of music). Psychometric properties were not evaluated because the questions in part 2 are factual, do not involve ratings, are not combined into scales, may not easily be reported through videorecordings, and refer to whole interventions. However, the questions in part 2 were presented to a group of yoga researchers and interventionists gathered at the 2016 annual Symposium on Yoga Research for informal input and vetting. These efforts were designed to help align the EPYQ (parts 1 and 2) with efforts to develop and publish a set of formal guidelines on the reporting of yoga interventions in medical literature. These guidelines will be adapted specifically for yoga based on the published TIDieR guidelines.[21]

Results

Phase III

As noted above, data from participants completing 80% of the questions were included in phase III analyses. Overall, 16.7% (163/973) of participants did not complete 80%. When comparing completers and noncompleters on baseline demographic variables, completers were significantly more likely to be older (43.6 years vs. 40.1 years for noncompleters) and of White-only race (87% vs. 61% of noncompleters).

Scale Development and Item Analysis

We employed exploratory factor analysis (EFA), along with expert opinion and item-level analysis, to develop the fourteen scales for the EPYQ using samples 1a and 1b as described above. The factor loadings from the exploratory factor analysis are shown in Table 2, along with the final item-total correlation, Cronbach's alpha, and item means and standard deviations. Two factors (Body Awareness and Yoga Philosophy) did not have loadings because they were developed on the basis of expert opinion and conceptual fit. These factors include items that are conceptually related and that had initially loaded rather weakly on various other scales. We specified these two new factors in our confirmatory model and tested them for model fit.

The items not included in the final scales are shown in Table 3, along with the factor(s) on which they loaded and the justification for their removal. Items were removed due

to loading on multiple factors, not loading strongly on any one factor, redundancy with other items, and conceptual clarity/expert opinion.

Confirmatory Factor Analysis

Confirmatory factor analysis showed that the final model and scales had good fit in the scale development sample (combined samples 1a and 1b), with an RMSEA of .061 (90% confidence interval [CI] 0.060–0.063) and an SRMR of .059. The chi-square test was significant ($p < 0.001$) and the CFI was .846. For the military subsample (sample 1b), the model also had adequate fit, with an RMSEA of .063 and SRMR of .063. The sample recruited from Yoga Alliance (sample 2) was used as a factor structure validation sample because these participants' scores were not used in the development of the scales, and the model still demonstrated reasonable fit, with an RMSEA of .064 and SRMR of .068. The chi-square was significant ($p < 0.001$) and the CFI was .846.

Internal Consistency Reliability

Internal consistency reliability of the scales is shown in Table 4, along with the mean and standard deviation of each scale. All fourteen scales had Cronbach's alphas of between .70 and .90, with most above .80.

Phase IV

Participants in phase IV were yoga students/practitioners and yoga instructors. Many were quite experienced and thus had practiced many different styles of yoga. The mean length of yoga experience for instructors and students was 12.8 years and 7.6 years, respectively.

Interrater Agreement

The ICCs for the raters of the class videos in phase IV are shown in Table 4. Averaged ICCs ranged from .712 to .982.

Test-Retest Correlations

Test-retest correlations, shown in Table 4, were adequate for most scales, with all but one ranging from .725 to .947. Health Benefits had a test-retest correlation of .487, but it also had the second-lowest standard deviation between classes, indicating that restriction of range may have been an issue.

External Validity: Correlations with Other Measures

Table 5 shows correlations between student self-report measures that we expected to correlate with the scale ratings from the trained raters. As expected, higher ratings of exertion on the Borg scale (with higher meaning more exertion) were positively correlated with the EPYQ scale scores of

Table 4. Phase IV EPYQ Rater Statistics

EPYQ Scale	ICC (Average)	Test-Retest Correlations	Expert Rater Mean Ratings	Expert Rater SD	Student Mean Ratings	Student SD	Correlations (Expert Raters with Students)
Acceptance/ Compassion	.826	.880	1.58	0.360	3.20	0.825	.581
Breathwork	.955	.947	2.58	0.264	3.19	0.805	.920
Physicality	.941	.947	2.37	0.207	2.66	0.775	.906
Postures, Active	.960	.879	2.98	0.260	3.22	0.726	.851
Postures, Restorative	.913	.725	2.30	0.214	3.23	0.716	.796
Body Locks	.908	.847	1.75	0.505	2.33	0.959	.709
Body Awareness	.882	.738	3.75	0.535	3.87	0.719	.670
Mental & Emotional Awareness/Release	.890	.762	1.93	0.274	2.84	0.948	.918
Health Benefits	.795	.487	1.65	0.242	2.24	0.904	.601
Individual Attention	.982	.978	2.61	0.175	2.56	0.712	.918
Social Aspects	.915	.849	1.71	0.308	1.92	0.579	.067
Spirituality	.935	.906	1.72	0.254	1.85	0.586	.957
Meditation & Mindfulness	.846	.860	1.82	0.303	2.34	0.792	.856
Yoga Philosophy	.712	.804	1.19	0.162	1.53	0.730	.954
Total (Average) Scores	.943	.932	2.14	0.290	2.64	0.770	.765

SD = standard deviation.

Table 5. Validity Analysis Results: Bivariate Correlations of EPYQ Scale Score from Trained Raters with Student Self-Report Measures

	EPYQ Scale	Correlation
Borg Rating of Perceived Exertion		
Predicted	Physicality	.545**
	Postures, Active	.317**
	Postures, Restorative	.036
	Bandhas	.291**
Statistically Significant	Meditation & Mindfulness	–.339**
	Breathwork	–.172*
	Mental & Emotional Awareness/Release	–.337**
	Health Benefits	–.387**
	Individual Attention	.312**
	Spirituality	–.241**
	Yoga Philosophy	–.192*
Vanderbilt Psychotherapy Process Scale (VPPS) Therapist Warmth and Friendliness Scale		
Predicted	Acceptance & Compassion	.024
	Mental & Emotional Awareness/Release	–.044
	Individual Attention	–.061
	Social Aspects	–.100
Statistically Significant	Postures, Active	–.209*
	Breathwork	.212*
	Health Benefits	.208*
	Spirituality	.216**
	Yoga Philosophy	.191*
State Mindfulness Scale (SMS)		
Predicted	Meditation & Mindfulness	–.086
	Acceptance & Compassion	.137
	Breathwork	.068
	Mental & Emotional Awareness/Release	.093
	Body Awareness	–.075

*$p < 0.05$; **$p < 0.01$.

Physicality, Active Postures, and Bandhas. However, no significant association was found between the Borg scale and Restorative Postures, although we expected an inverse correlation. Exertion was also negatively and significantly associated with EPYQ scores on Meditation/Mindfulness, Breathwork, Mental and Emotional Awareness/Release, and Health Benefits, and positively and significantly correlated with Individual Attention. We anticipated EPYQ scores for teacher warmth and friendliness would be correlated with a number of scales, but none of our hypothesized scale relationships were significant. However, teacher warmth was positively and significantly associated with EPYQ scores for Breathwork, Health Benefits, Spirituality, and Yoga Philosophy, and negatively and significantly associated with Active Postures. Finally, changes in Mindfulness after the 1-hour class were not significantly associated with any of the EPYQ scales.

Discriminant Validity: Ratings for Different Yoga Types

A radar chart of the mean EPYQ scale ratings (trained raters) for all fifteen yoga classes studied is difficult to interpret visually. Thus, Figure 1 presents four yoga styles (Kundalini, Iyengar, Pranayama, and Bikram) chosen to elucidate some expected differences. In addition, Table 6 shows scores for the fifteen different sessions on the EPYQ scales.

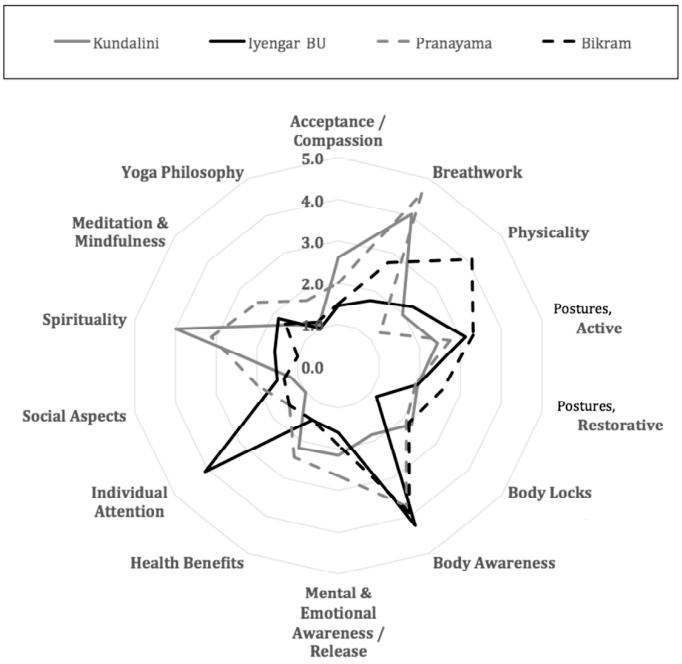
Trained Raters vs. Student Ratings

For the six classes in which students were asked to complete the same EPYQ measure that was completed by the trained raters, there was more variability (lower agreement) among the students (.579 to .959) than among the expert raters (.162 to .535) for all of the scales, as shown by the average standard deviations in Table 4. Table 4 also shows the correlation between the mean of the student/teacher ratings and the mean of the expert raters across the six classes on each of the scales, which range from .067 to .957.

Discussion

This project sought to identify and classify the essential dimensions of yoga interventions, and to develop a psycho-

Figure 1. EPYQ Ratings: Subset of Specific Yoga Types



Note: We predicted that Bikram would require the most physical exertion, followed by Iyengar and Kundalini, with Pranayama as the least active practice. We anticipated that exertion would have an inverse correlation with more meditative aspects of yoga practice.

BU = Boston University site.

metrically sound measure of yoga components for use in yoga intervention research. At the conclusion of this project, a psychometrically sound instrument—the EPYQ—was successfully produced. The EPYQ gives researchers the ability to measure the relative emphasis placed on the essential components of yoga by any given yoga intervention. By intervention, we are referring to a series or recommended course of yoga sessions designed to produce measurable changes in physical and mental health.

The EPYQ is designed to produce objective and replicable results. Our phase I focus group work suggested that individuals often have very different internal experiences in a yoga class even when participating in the same yoga sessions or intervention. Individuals will inevitably hold their own unique set of experiences and reference standards against which they will interpret their yoga experience. They may also attend to different aspects of the same intervention and have varying ability levels that allow them to participate in different ways. Thus, while understanding the internal, person-level experiences of yoga participants may be fruitful and interesting, the EPYQ was specifically designed to focus on the more objective and observable aspects of yoga interventions themselves. For this reason, the EPYQ measure uses structured questions and has been validated using trained expert raters. Across the four phases of the study, we developed a standardized, reliable, and valid instrument that is now ready for use in intervention research.

The EPYQ measure also includes a part 2 that characterizes the intervention setting and context. Because our primary focus was on describing the essential elements of yoga itself, and part 2 is more factual and meant to be completed by study investigators, tests of psychometric properties cannot easily be applied to this section. However, as indicated above, feedback and comments received from yoga research and intervention experts were obtained and used to refine part 2. Further development of part 2 will particularly benefit from pilot testing. EPYQ part 2 is important in that it will standardize a more complete reporting of yoga intervention characteristics. More detailed reporting of yoga intervention characteristics has been advocated before,[39] and although improvements have occurred over time, adequate detail has often been lacking,[20,40] hindering interpretation of the yoga intervention literature.

As shown in Table 4, statistics from the ratings of expert raters indicate that the fourteen scales typically had high ICCs and thus held together as separate constructs. The Yoga Philosophy and Health Benefits scales had the lowest ICCs. These two scales also had the lowest standard deviations among raters, indicating that a lack of variability and possible lack of content addressing these scales in the fifteen classes used in phase IV may have contributed to the weaker performance of these scales. When arranging to conduct fifteen yoga classes for research purposes, it was not possible to ensure that all fourteen components/scales would be addressed in varying amounts as would be optimal for such ratings. Specifically, yoga philosophy is clearly addressed in some yoga interventions but was not well-represented in the fifteen classes tested. As suggested by the mean ratings in Table 4, Body Awareness, Breathwork, and Active Postures stood out as being addressed to the greatest extent in the fifteen classes used, followed by Individual Attention and Physicality. Finally, it is also of note that Health Benefits had relatively low test-retest reliability.

An important question is whether the process by which the scales were assessed may underemphasize some yoga components, such as Meditation and Spirituality, which may be less directly observable variables of interest. While this is possible, we explicitly chose to start each question with the stem, "How much did the instructor mention or include . . . " because our focus-group data suggested that internal experiences were highly variable across the same intervention. As noted earlier, yoga as a broad philosophy and/or spiritual system includes countless practices. Many types of yoga include no postures at all and are almost

Table 6. Mean EPYQ Ratings on Specific Yoga Types: All Classes

EPYQ Domain	Kundalini	Breath (Military)	Ashtanga Class A	Baptiste	Kripalu	Restore (Military)	Iyengar Class A	Vinyasa Flow II (Military)	Vinyasa Flow II	Yin	Prana	Forrest	Ashtanga Class B	Iyengar Class B	Bikram
Acceptance/ Compassion	2.6	2.05	1.25	1.3	2.5	1.1	1.5	1.8	2.2	1.6	2.0	2.7	1.35	1.6	1.5
Breathwork	4.1	4.4	3.1	3.0	3.7	3.2	1.8	3.5	3.2	2.0	4.6	3.3	3.2	1.3	2.8
Physicality	2.0	1.5	2.8	3.6	3.1	1.3	2.3	3.4	3.2	1.4	1.3	3.5	3.1	2.1	4.1
Postures, Active	2.4	3.0	3.4	3.3	3.5	2.8	3.1	2.8	3.5	2.6	2.8	3.4	3.1	3.0	3.3
Postures, Restorative	2.0	2.3	2.3	2.0	2.6	2.6	2.0	2.4	2.5	3.2	1.9	2.4	2.1	2.2	2.6
Body Locks	2.3	1.0	3.7	1.8	1.9	1.1	1.2	1.4	1.7	1.3	2.1	2.1	2.7	1.1	2.2
Body Awareness	1.8	3.7	2.1	2.8	3.5	3.8	4.3	2.5	3.3	3.1	3.8	3.5	2.8	4.7	3.9
Mental & Emotional Awareness/ Release	2.2	1.5	1.2	1.5	2.5	2.6	1.6	1.5	1.6	2.3	2.7	2.0	1.4	1.9	1.9
Health Benefits	2.2	2.1	1.2	1.5	1.4	2.0	1.4	1.3	1.8	1.7	2.4	1.8	1.1	1.8	1.4
Individual Attention	1.0	1.0	3.4	2.8	2.0	1.8	4.1	4.3	3.1	1.0	1.5	4.1	3.7	3.9	1.5
Social Aspects	1.2	1.5	1.5	2.0	1.5	1.0	1.5	1.2	1.3	1.4	2.0	2.1	1.5	2.5	1.3
Spirituality	4.0	2.8	1.5	1.6	1.6	1.8	1.6	1.8	1.8	1.5	3.1	2.4	1.4	1.8	1.0
Meditation & Mindfulness	1.6	2.7	1.1	1.3	1.6	1.8	1.8	1.9	1.3	2.1	2.5	1.8	1.4	1.5	1.6
Yoga Philosophy	1.1	1.3	1.0	1.0	1.1	1.2	1.0	1.0	1.2	1.3	1.8	1.3	1.0	1.0	1.2

exclusively meditation-oriented.[41–43] Although we included a Pranayama class and a Kundalini class with fewer postures, the EPYQ was developed with a focus on yoga styles that include postures and movement. The EPYQ measure is designed to accommodate a much wider range of yoga and/or other mind-body practices, but further research is necessary. We do expect the scales to differentiate even better between such practices.

Given recent interest in the "healing" aspects of yoga and other complementary and integrative health (CIH) modalities, it is notable that four items that mentioned healing were eliminated in phase III. As shown in Table 3, all four items were highly correlated with similar items in the Health Benefits scale and thus were redundant. We examined whether they could be forced into a separate "healing" factor or scale, but this scale was not psychometrically sound. While it is possible that these questions would produce a more distinct factor in a different sample, our samples were large and represented a wide range of yoga students.

Our concurrent validity results demonstrate that it was challenging to validate the EPYQ by correlating its scales with other measures, partially because it was difficult to identify "state" measures of relevant constructs that could be expected to change after a single yoga class. In addition, it was not possible to locate and study yoga interventions that could be expected to affect all of the fourteen scales in this study.

One exception was the Borg scale, which correlated with three of the four a priori predicted scales, as well as seven other scales not predicted to relate to it. The hypothesized relationships were borne out such that almost all of the scales labeled as "statistically significant" had negative correlations, while our predictions focused on identifying positive correlations. However, it seems intuitive that yoga styles that emphasize meditation, spirituality, or emotional release produce less physical exertion overall. Scales such as Spirituality, Breathwork, and Health Benefits were also associated with perceptions of greater teacher warmth and friendliness. Given that the yoga sessions were all a single 1-hour class, and that most measures have been shown to be sensitive to change over much longer periods (e.g., state mindfulness), our ability to demonstrate strong validity was limited with this study design.

Limitations

We acknowledge that our measure may not capture all important aspects of all yoga interventions, including aspects that may be specific to certain populations (e.g., hospital inpatients) or approaches taught in other countries but not well studied. The lack of diversity in our samples with respect to gender, ethnicity, and education also limits the generalizability of our findings to broader populations. Furthermore, because we could not easily vary all fourteen components across the fifteen classes included in our ratings, certain components (e.g., yoga philosophy) had limited variability, which in turn limits our ability to test them with the EPYQ.

Additionally, because our study exclusively used video ratings, we are unable to ascertain whether live ratings differ from video ratings. The use of an objective trained-rater system is another limitation in that it requires additional time, resources, and coordination between yoga researchers. Future studies may investigate solutions for decreasing burden of administering and scoring the EPYQ for researchers (e.g., creation of a short form).

The study was limited in that recruitment of participants for samples 1a and 1b was conducted in the United States. No exclusion criteria required participants to be from the United States, but IP tracking suggests almost all participants in these samples were located there. Conversely, sample 2 recruitment was conducted internationally, and was found to confirm the results found in samples 1a and 1b.

Conclusions

Ways this Measure Will Advance Research in Yoga Interventions

Enabling Comparison Across Studies of Yoga

Minimal research has compared different styles of yoga, but there are indications that different types of yoga may have different effects.[40] The ability to validly measure and characterize the various components used in intervention trials will allow comparison across those studies.

Informing Adequate Control Conditions

Ultimately, the ability to quantify the components of yoga interventions will inform researchers conducting RCTs about the components to include in their control or comparison conditions, allowing them to isolate the components of yoga that they hypothesize to be the active ingredients in their intervention. The EPYQ represents an important step in this direction, as we identified and developed a scale for describing the components of differing yoga styles.

Facilitating Comparisons of Yoga with Other CIH Interventions

A quantitative measure of the yoga components in a given intervention will also allow comparison with other CIH modalities that may include some of the same components (e.g., mindfulness) but differ in other components (e.g., physical postures, spiritual teachings). The EPYQ has the potential to build upon research on other CIH modalities that have been previously examined with measures such as the Meditative Movement Inventory (MMI).[44] In addition to measuring the breathwork and meditative aspects included

in the MMI, the EPYQ measures many other components present across several CIH modalities.

Determining the Relative Efficacy of Various Components of Yoga

Measuring the quantity of various components present in an intervention will permit analysis of the extent to which individual components have relatively greater effect on a given outcome with a specific population.

Identifying Mechanisms of Effect

For yoga intervention studies, quantitative measures of the various components of yoga across many studies or in meta-analytic studies can facilitate the isolation of intervention components that are most powerful (e.g., exertion vs. relaxation) or most closely linked to specific outcomes, which will inform research on the biopsychosocial mechanisms of effect.

Developing Targeted Yoga Interventions

Quantifying the essential properties of yoga interventions may help to determine which specific components are relatively more helpful for particular populations or specific health conditions. One review of yoga interventions conducted with cancer patients found different results depending on the type and stage of cancer, and on the point in cancer treatment trajectory.[17] However, the yoga interventions studied also differed, making it difficult to determine whether intervention or disease factors were most at play. By describing yoga interventions in more detail and linking specific intervention components to specific effects, mind-body researchers can proceed toward tailoring interventions to specific health conditions.

Assessing Receptivity

Refined knowledge of the dimensions of yoga interventions may help to identify receptivity of different clinical populations to yoga interventions (e.g., veterans might be more open to physically oriented yoga; people with certain types of mental health issues may be more open to restoratively oriented yoga, etc.).

The EPYQ will allow users to rate the levels of various components of yoga interventions and is now appropriate for use by objective trained raters. Ratings by teachers and students is another direction that should be explored. Objectively trained raters provide an important perspective on what is being delivered in any given yoga class. However, the extent to which the ratings of the students receiving the class relate to the objective ratings, and the relative relationship of EPYQ scores from students or expert raters to the health outcomes that they report, are empirical questions that can only be answered when a valid tool is made available. Thus, the EPYQ tool as validated in this study rates what is taught in the intervention, and not what the students/practitioners actually do or their perceptions of what they experience such as perceived mindfulness or physical exertion. This focus on objectivity was intentional because different students may perceive the same class as very strenuous or high on mindfulness while another individual could rate the same class as nonstrenuous or not particularly focused on mindfulness. Differences between students and trained raters also may reflect differences in training. We found that training resulted in more reliable and less variable ratings.

The EPYQ will open the door to many such important research questions.

How to Use the EPYQ Now

At present, our data suggest that trained raters are necessary to produce the reliability needed to validly measure the EPYQ scales. Thus, we urge yoga intervention researchers to videorecord their sessions to allow trained raters to provide these scores. We are also in the process of developing more efficient ways to train additional raters and are working on determining alternative approaches to scoring interventions. Please email the research team (crystal.park@uconn.edu) for additional guidance on using the measure.

Long-Term Significance of this Project

The development of the EPYQ as a psychometrically sound tool for assessing and describing the components of yoga interventions is expected to lead to the improvement and tailoring of yoga interventions, and ultimately to improve intervention effectiveness with a range of different health conditions. Yoga has the potential to play an important role in improving the health and well-being of substantial numbers of people, and a richer understanding of yoga interventions will aid in that mission. In addition, having a valid yoga assessment tool will advance the science of CIH and potentially be useful to those conducting other mind-body CIH interventions.

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