

2013 SYR Accepted Poster Abstracts

1. Benefits of Yoga as a Wellness Practice in a Veterans Affairs (VA) Health Care Setting: If You Build It, Will They Come?

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Key Words: multisymptom illness, PTSD, pain, fatigue

Objective: Veterans evaluated at the WRIISC present with multiple and chronic health conditions such as posttraumatic stress disorder (PTSD), pain, and fatigue. These patients often experience poor symptom relief. A pilot project was designed to determine whether such veterans would practice yoga as an adjunct to conventional medical care. We also used a range of standard screening measures to examine the health profile of individuals.

Methods: Veterans were referred by VA clinicians to a WRIISC yoga clinic established in 2009. Two classes were offered per week. Veterans were assessed at baseline and after 12 classes with the PTSD Checklist (PCL), Short Form McGill Pain Questionnaire (SF-12), and the Flinders Fatigue Scale (FFS).

Results: There have been 293 patient referrals so far and more than 1,824 yoga contact hours. Detailed data were collected on 10 veterans age 53–85 yrs (6 males). The screening instruments revealed nonsignificant benefits of yoga across the classes ($p > .05$). Furthermore, the PCL scores showed that four patients (40%) screened positive for PTSD (mean severity score = 40.9, range = 18–70). In addition, the PCL showed positive correlations with measures of pain (FS-12; Spearman's $\rho = .76$, $p < .01$), and chronic fatigue (FFS; Spearman's $\rho = .94$, $p < .001$). Similar results were found for equivalent correlations after 12 yoga classes.

Conclusion: This pilot study demonstrates that veterans accept yoga as a complementary treatment to their regular medical care. Of possible significance is the observation that 40% of the patients screened positive for PTSD. The reasons for this are not clear but may be because such patients were referred at a higher rate. It is also possible that PTSD patients seek out yoga classes as an effective means of treating their symptoms. The strong correlations between measures of PTSD, pain, and fatigue suggest far-reaching implications for the integration of yoga in the treatment of veterans with a broad array of disorders exacerbated by stress.

2. Yoga-based Psychotherapy Group With Urban Youth Exposed to Trauma

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Key Words: yoga, trauma, youth

Objective: It is well documented that children who have experienced abuse and neglect are at risk for developing emotional and behavioral problems, including posttraumatic stress, depression, low-self-esteem, and aggression. Yoga is believed to regulate the systems responsible for the body–brain connections where stress and traumatic experiences lead to immediate and future mental and physical illness. We propose that yoga can have positive effects in improving the emotional functioning of youth exposed to trauma.

Methods: Participants were mental health patients age 8 to 12 years old with a history of trauma who opted to participate in a 12-week yoga-based psychotherapy group. Measures of interpersonal functioning (Behavioral and Emotional Rating Scale, BERS), externalized and internalized behaviors (Child Behavior Checklist, CBCL) were collected at baseline, immediately following the intervention, 3 and 12 months later.

Results: Clinically significant improvements in mean internalizing scores (mean improvement 9.8, 95% CI 7.0 to 12.5; $p < 0.01$) were noted for children in the Yoga Based Psychotherapy Group from baseline to 12 months. BERS scores yielded statistically significant mean improvements in Interpersonal, Family Strength, and Affective Strengths subscales (mean improvements on subscales ranged from 0.7 to 1.3; $p < 0.05$) and Total Strengths score (mean improvement 8.2; $p = 0.013$).

Conclusion: These results provide encouraging evidence of the effectiveness of yoga for improving mental health functioning for youth exposed to trauma.

3. Embodied Health: The Effects of a Mind–Body Course for Medical Students

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Key Words: education, yoga

Objective: An effective career in medicine requires empathy and compassion, yet the demands of a medical education increase stress and decrease students' ability to connect with

patients. However, research suggests mind–body practices improve psychological well-being. This study aimed to evaluate the psychological effects on medical students of an 11-week elective course, Embodied Health (EH), which combines yoga and meditation with neuroscience didactics.

Methods: The effects on 27 first- and second-year medical students were evaluated via surveys in four areas: empathy, perceived stress, self-regulation, and self-compassion. Scales used were (a) Jefferson Scale of Physician Empathy, which measures empathy among health students and professionals and medical students on a scale of 1 (*least empathetic*) to 7 (*most empathetic*); (b) Cohen's Perceived Stress Scale, a measure of the perceived uncontrollability of respondents' lives, from 0 (*least stressed*) to 4 (*most stressed*); (c) Self-Regulation Questionnaire, which measures the development and maintenance of planned behavior to achieve goals, from 1 (*least self-regulated*) to 5 (*most self-regulated*); and (d) Self-Compassion Scale, which measures self-criticism, from 1 (*least self-compassionate*) to 5 (*most self-compassionate*). Students also reflected on EH's impact on their well-being in a postcourse essay.

Results: Self-regulation and self-compassion rose 0.13 ($SD = 0.20$, $p = 0.003$) and 0.28 ($SD = 0.61$, $p = 0.04$), respectively. Favorable changes were also seen in empathy and perceived stress, which increased by 0.11 ($SD = 0.50$, $p = 0.30$) and decreased by 0.05 ($SD = 0.62$, $p = 0.70$), respectively; these changes did not reach statistical significance. Students' essays were found to discuss the following recurrent themes: (a) reconnection between mind and body, (b) community in a competitive environment, (c) increased mindfulness, (d) confidence in use of mind–body skills with patients, and (e) stress management. These themes overlapped with the measures EH affected quantitatively.

Conclusion: A mind–body course for medical students increased self-regulation and self-compassion. Qualitative themes discussed in students' postcourse essays reflected these effects.

4. Interoceptive Awareness and Vegetable Intake After a Yoga and Stress Management Intervention

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Key Words: yoga, psychological health, interoceptive awareness, dietary behavior change

Objective: Cross-sectional research links yoga to healthy dietary behaviors, although little research has assessed yoga's longitudinal impact on these behaviors. Yoga has also been related to increases in body awareness, representing a potential mechanism by which yoga may facilitate dietary improvements. We conducted a three-armed randomized, controlled trial comparing 8 weeks of yoga to cognitive behavioral stress manage-

ment (CBSM) and a wait-list control condition.

Methods: Participants ($N = 30$; M age = 18, $SD = 1.14$) were recruited from among entering first-year women at a large public university. Inclusion criteria included no more than four lifetime yoga classes and no exercise-related contraindications. Participants were randomly assigned to one of two treatment conditions: yoga ($n = 8$) or CBSM ($n = 8$). A passive wait-list control group ($n = 14$) was composed of those with scheduling constraints. Data were collected at baseline (T1) and postprogram (T2), and analysis was conducted on change scores (T1–T2). Measures administered via Qualtrics' online survey interface included the Multidimensional Awareness of Interoceptive Awareness (MAIA) and the National Institutes of Health Eating at America's Table Study Quick Food Scan (QFS).

Results: Statistically significant increases ($p > 0.05$) in MAIA subscale Emotional Awareness (e.g., "I notice how my body changes when I feel happy/joyful") were observed in the yoga ($M = 1.0$, $SD = 1.57$) and CBSM ($M = 0.98$, $SD = 1.85$) groups relative to controls ($M = -0.35$, $SD = 1.06$). The yoga group had significantly greater gains ($p > 0.05$; $M = 1.05$, $SD = 1.04$) on MAIA subscale Body Listening (e.g., "I listen to my body to inform me about what to do") than did controls ($M = -0.17$, $SD = 0.98$). Yoga group participants evidenced a statistically significant increase in vegetable servings ($p > 0.05$; $M = 2.39$, $SD = 3.3$) compared with CBSM ($M = -0.71$, $SD = 1.93$). Yoga group increases in vegetable consumption corresponded to MAIA gains in Emotional Awareness ($r = 0.953$, $p > 0.001$).

Conclusion: A biweekly, 8-week yoga program may confer greater benefits in domains of body listening and vegetable consumption than does CBSM. That yoga and CBSM shared change on emotional awareness suggests both may be effective in improving this construct. Future research should explore the mechanisms underlying each observed increase. The MAIA is a new scale that has not been validated in a college sample, while the low N and large SD s limit generalizability and validity of findings.

5. Yoga Reduces Performance Anxiety in Adolescent Musicians

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Key Words: musicians, performance, anxiety, yoga

Objective: Professional musicians often experience high levels of stress, music performance anxiety (MPA), and performance-related musculoskeletal disorders (PRMDs). Given the fact that most professional musicians begin their musical training before age 12, it is important to identify interventions that will address these issues from an early age. This study expands on prior

research by evaluating the effects of a yoga intervention on MPA and PRMDs in a sample of adolescent musicians.

Methods: Adolescent musicians attending a summer music fellowship program in 2007 and 2008 were invited to participate in a Kripalu yoga intervention. All students who responded to the initial invitation were assigned to the yoga group ($n = 84$). A second email recruited control participants ($n = 51$) from the remaining students. The intervention group took part in a 6-week yoga program involving up to three 60-minute classes per week, and the control group received no treatment. Regression analyses were conducted on the combined 2007 and 2008 samples to evaluate the effects of the yoga program on MPA and PRMDs. MPA was measured using the Performance Anxiety Questionnaire (PAQ) and the Music Performance Anxiety Inventory for Adolescents (MPAI-A). PRMDs were measured using the Performance-Related Musculoskeletal Disorders Questionnaire (PRMD-Q).

Results: Yoga participants showed statistically significant reductions from baseline to end-program compared to the control group ($p < .05$; pre-post difference score means \pm SDs below) on total MPAI-A (yoga = -7.98 ± 11.86 , control = 0.41 ± 9.06), the somative/cognitive MPAI-A subscale (yoga = -4.95 ± 7.86 , control = 0.34 ± 6.00) and the performance evaluation MPAI-A subscale (yoga = -1.97 ± 3.91 , control = 0.55 ± 2.89). Relative to the control group, yoga participants also showed significant reductions on the PAQ solo performance subscale (yoga = -7.86 ± 10.89 , control = -1.70 ± 8.00) and group performance subscale (yoga = -4.17 ± 10.71 , control = -0.75 ± 11.44). The results for PRMDs varied by year. Yoga participants in the 2008 sample showed significant reductions in PRMD-Q severity when compared with controls ($p < .05$, yoga = -8.90 ± 17.80 , control = 4.3 ± 15.80), whereas no significant changes in PRMDs emerged in the 2007 sample.

Conclusion: Yoga may be a promising treatment modality to alleviate MPA in adolescents and possibly prevent the early disruption and termination of musical careers.

6. Designing and Implementing a Therapeutic Yoga Program for Older Women With Knee Osteoarthritis

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Key Words: yoga, osteoarthritis, knee

Objective: The purpose of this study was to develop and implement a safe and enjoyable therapeutic yoga program for older women with osteoarthritis (OA) of the knee.

Methods: Multiple sources were used in the design and development of the program, including an expert panel discussion, relevant research articles and books, the Arthritis Foundation website, and the professional experience and training of the

yoga instructor. Subjects participated in 8 weekly 60-minute group classes (≤ 9 students/class) and a 30-minute home practice 4 times/week. The program consisted of gentle Hatha yoga postures (fostering mobility and stability of the knees and surrounding joints), diaphragmatic breathing, and mindfulness/relaxation training. Challenges taken into account when designing the program included avoiding aggravating postures, safety with transitional movements, managing comorbidities, and catering to a wide range of physical abilities between subjects. Yoga props were used to enhance safety and comfort in the postures. Frequencies of class attendance and home practice, adverse events, and program acceptability and difficulty were measured.

Results: A total of 36 older women were enrolled (mean age = 72 years, range 65–86 years). Almost 40% of participants had a BMI of over 30, and 44% had 2–3 comorbidities. The dropout rate was 5%. The majority of participants ($n = 25$) attended $\geq 75\%$ of classes, with common barriers of being too busy/illness. Sixty-nine percent of participants practiced yoga at home ≥ 4 days/week (average 114 minutes). No adverse events were reported. Acceptability and program difficulty ratings were 9/10 (10 = extremely enjoyable) and 4/10 (10 = extremely difficult).

Conclusion: The results of this study showed yoga to be a safe and enjoyable form of exercise for older women with knee OA. When class sizes are kept small, a safe yet therapeutic yoga experience is possible for women of ranging physical abilities. The specific yoga sequence designed in this study will be a useful resource for teachers and students who are struggling with how to adapt a yoga practice for knee OA. Results from this study will inform the design of a larger clinical trial to further develop a therapeutic yoga approach to OA.

7. Yoga and Life Skills Eating Disorder Prevention Among 5th Grade Females: A Controlled Trial

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Objective: To assess the effectiveness of an eating disorder prevention program (i.e., Girls Growing in Wellness and Balance: Yoga and Life Skills to Empower) that uses yoga instruction and integrates psychoeducation (e.g., media literacy), dialectic behavioral techniques (i.e., DBT), and constructivist techniques (e.g., project-based learning). This prevention intervention addresses the specific needs of preadolescent females during the critical transition into puberty and adolescence that places them at high risk for eating disorders and anxiety regarding their role and development as a female in our culture.

Methods: A total of 170, 5th grade girls were recruited for the study ($n = 127$ prevention, $n = 43$ controls). There were no significant differences in key demographic variables between groups. In groups of 10 to 15 members, the prevention groups participated in 12 sessions consisting of 1 hour of yoga instruc-

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tion, 45 minutes of life skill building activities, and 15 minutes of relaxation/meditation. The control group received no intervention. Primary pre- and posttest measures were drive for thinness, body dissatisfaction, and eating disorder symptoms (Eating Disorder Inventory-3).

Results: There was a significant effect of group participation on Drive for Thinness ($\Delta R^2 = .078$, $p = .001$) and Body Dissatisfaction score ($\Delta R^2 = .046$, $p = .013$). Compared with controls, group participants endorsed fewer items on the Drive for Thinness and Body Dissatisfaction scales at posttest. There was no significant effect of group on eating disorder symptoms, a common finding in eating disorder prevention among younger girls resulting from low base rates and pretest.

Conclusion: These data indicate that the yoga and life skills prevention group may have a preventive effect in risk factors associated with eating disorders in adolescent females. Randomized, controlled trials are needed to further explore efficacy.

8. A Randomized, Controlled Trial Comparing the Impact of Yoga and Physical Education on the Emotional and Behavioral Functioning of Middle School Children

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Key Words: yoga, middle school children, emotions, behavioral functioning

Objective: Yoga programs geared for school children have become more widespread, but research regarding its impact on children is lacking. Several studies have reported positive outcomes, but more randomized, controlled studies are needed.

Methods: Thirty middle school children were randomized to participate in either a school-based yoga or physical education (PE) class three times a week for 12 weeks. Emotional (i.e., affect, self-worth) and behavioral (i.e., internalizing and externalizing problems, proactive and reactive aggression) functioning was measured pre- and postintervention.

Results: A series of within-subjects repeated-measure ANOVAs was conducted for each measure to assess for significant changes from pre- to postintervention by group (either yoga or PE). Interaction effects were not significant for self-reported positive affect, $F(1,24) = .00$, $p = .97$; global self-worth, $F(1, 21) = .75$, $p = .40$; reactive, $F(1, 24) = .23$, $p = .63$, or proactive aggression, $F(1, 24) = .31$, $p = .58$; nor parents' report of their children's externalizing, $F(1, 13) = .62$, $p = .45$, or internalizing problems, $F(1, 15) = .01$, $p = .91$. Self-reported negative affect appeared to change across time by group, $F(1, 23) = 5.40$, $p < .05$, $\eta^2 = .06$; with negative affect increasing in the yoga group; simple effects tests did not support a significant interaction.

Conclusion: A rigorous study design was used but was limited by a small sample size; findings suggest that yoga and PE classes do not differentially affect middle school children's emotional and behavioral functioning. Although the results were unexpected, practical insight has been gained on the mechanics of running a school-based study and the appropriate outcomes to measure in relation to a yoga program. The authors suggest measuring intervening variables, such as mindfulness and body awareness, and choosing a sample that does not lend itself to potential floor and/or ceiling effects, measuring variables at multiple time points, and ensuring that the school personnel support and accommodate the research staff and yoga classes.

9. Feasibility of a Multisite, Community-based Randomized Study of Yoga and Wellness Education for Women With Breast Cancer Undergoing Chemotherapy

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Key Words: yoga, breast cancer

Objective: Depressive symptoms, fatigue, and sleep disturbances increase while health-related quality of life (HRQOL) declines during chemotherapy. Growing evidence supports benefits of yoga for posttreatment cancer survivors, but yoga during chemotherapy has received minimal attention. This study sought to estimate accrual, adherence, and retention to a multisite, community-based trial during breast cancer chemotherapy and to obtain preliminary efficacy estimates.

Methods: Women undergoing chemotherapy for Stages I–III breast cancer were recruited from three Community Clinical Oncology Program sites and randomized to a Gentle Yoga (GY) or Educational Wellness (EW) intervention (10 75-minute weekly sessions). Depressive symptoms, fatigue, sleep disturbance, and HRQOL were assessed at baseline, midintervention (Week 5), and postintervention (Week 10). Accrual, adherence, and retention rates were recorded, and intervention feedback was assessed at Week 10.

Results: Forty women (ages 29–83, median = 48; 88% Caucasian) were randomized to GY ($n = 22$) or EW ($n = 18$). Groups did not significantly differ on baseline characteristics, adherence (64% GW, 72% EW had $\geq 70\%$ class attendance), or retention (82% GY, 89% EW). Participant feedback was positive and comparable between study groups. In both groups, 100% of participants liked the classes “quite a bit” or “very much,” and $>90\%$ rated classes helpful and instructors competent. When asked what they liked best about the class, GY participants fre-

quently commented on relaxation and improvements in symptoms/physical function. Four yoga participants noted that treatment side effects interfered with ability to attend classes. Preliminary results suggest that yoga may positively influence fatigue and sleep disturbances, compared with educational wellness; however, this study was not powered to detect statistically significant differences.

Conclusion: This study demonstrated the feasibility of implementing a community-based randomized trial of yoga with an active comparison group for women undergoing chemotherapy for breast cancer. However, there are challenges to conducting yoga research during breast cancer treatment: (a) missing class because of symptoms, and (b) the need for yoga teachers with cancer-specific training in multiple communities. Targeting patients with greatest need upon study entry and increasing portability/accessibility of interventions are critical.

10. A Delphi Study for the Development of Protocol Guidelines for Yoga Interventions in Mental Health

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Key Words: yoga, mental health, depression, anxiety, well-being, protocol guidelines, Delphi method

Objective: Previous research suggests benefits of yoga for reducing depression and anxiety. However, common concerns in reviews of the research include lack of detail, rationale, and consistency of approach of yoga interventions used. This study aims to develop consensus-based protocol guidelines for yoga interventions for people with depression or anxiety.

Methods: The Delphi method was used to establish consensus from experienced yoga teachers. Two rounds of an online survey were sent to 33 teachers: 24 and 18 participated in each round. The first round sought views of participants. The second round sought consensus on a summary of those views. Survey questions were related to expected benefits, frequency and duration, approaches and techniques to be included or avoided, and training and experience for yoga teachers.

Results: For people with mild or moderate depression or anxiety, 95% of participants expected a 50% to 90% (median 80%) reduction of symptoms. Less benefit was expected for severe conditions. A total of 78% of participants agreed that a personal yoga practice would be beneficial if it was done an average of 5 times per week for an average of 30 to 40 minutes. 94% of participants agreed that 6 weeks of the yoga practice would be required. Numerous and detailed recommendations for yoga techniques to include or avoid were collected in the first round. The second round produced a consensus statement of guidelines for yoga postures, breathing, relaxation, meditation and other yoga techniques, and related lifestyle factors, to include or

avoid. Consensus was also achieved in recommendations for training and experience of yoga teachers working in mental health. More than 88% of participants agreed it was very important or essential for teachers to have a minimum of 500 training hours over 2 years, 2 years teaching experience, training in developing personalised yoga practices, training in yoga for mental health, and professional supervision or mentoring.

Conclusion: The Delphi process has achieved a consensus opinion on the application of yoga for reducing anxiety and depression. This consensus is now being converted into protocol guidelines that aim to facilitate consistency of interventions and enhance clinical research into the outcomes of such interventions. The next step in our own research is to implement and evaluate the efficacy of the protocol-based yoga intervention for the reduction of anxiety and depression and improvements in well-being.

11. Impact Investigation of Breathwalk Daily Practice: Canada–India Collaborative Study

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Key Words: Breathwalk, breath, walking, meditation, stress reduction

Objective: Breathwalk (BW), the science of combining breath patterns with steps and focused attention, originating from 5,000-year-old Kundalini yoga as taught by Yogi Bhaajan, PhD, conditions the body, mind, and spirit. Synchronizing the conscious, correct breathing with walking revitalizes harmoniously. In addition to the aerobic benefits of BW, its practice brings about concrete changes to elevate mood, reduce stress, and improve energy, mental clarity, and connectedness.

BW's five-step program called *Simple Anxiety to Inner Calm* (Awakeners, Align, Vitality, Balance, and Integration) was used during the study. The objective was to teach BW to students of Annamalai University Rajah Muthiah Medical College Hospital Nursing School (Chidambaram, India) to investigate practice impact on vital signs, 6-minute walk test, and self-esteem.

Methods: A total of 50 students were numerically selected and divided into a BW group ($n = 25$; odd numbers) and a control group ($n = 25$; even numbers). Prior to the study, informed consents were obtained from all. Pre- and postassessments were taken of all participants, and findings were noted. Participants were females ages 18–21 years. The BW group received 2-hour intensive training before starting the study. Individual instructions were given to ensure each participant's breathing technique was correct, the synchronization of breath, steps, primal sounds, and finger magic were well understood and performed. BW group classes were conducted at the same time each day for a period of 45 minutes per session for 15 consecutive days. The control group was instructed to pursue normal daily activities.

The control group received BW training after the study was concluded. Rosenberg's Self-esteem Scale, 6-minute walk test, and vital signs (pulse rate, respiratory rate) became the outcomes of study.

Results: The pre- and posttest assessments statistical analysis of Rosenberg Self-esteem Scale (t value = -2.326 , p value = 0.02), 6-minute walk test (t value = -5.067 , p value = 0.00) and respiratory rate (t value = 1.977 , p value = 0.05) showed significant improvements for the BW group. No changes of significance for the control group occurred.

Conclusion: Self-esteem increased, respiratory rate decreased, and walking ability increased in distance, demonstrating that the physical health, mental health, and fitness of the BW group improved significantly compared with results in the control group. The Breathwalk study suggests that this easy, accessible, and inexpensive technique improves overall health.

12. Yoga Improves Distress, Fatigue, and Insomnia in Older Veteran Cancer Survivors: Results of a Pilot Study

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Key Words: yoga, cancer, veterans

Objective: To determine if yoga is efficacious in treating self-reported physical and mental health issues in older veteran cancer survivors. Previous research shows that yoga is beneficial for anxiety and fatigue in female breast cancer survivors; however, most cancer survivors are older adults and 45% are male. In our previous research, 56% of older male veterans stated an interest in "prevention and wellness" after cancer, 66% cited specific interest in physical therapy (PT) or exercise, but only 15% in yoga. Potential benefits of yoga have not been studied in older veterans who are cancer survivors.

Methods: We present pre-post pilot data for 22 veterans (age 55–84, $M = 68.45$ years; all male but one) diagnosed with cancer ($n = 6$ prostate, $n = 4$ blood, $n = 5$ colorectal, $n = 3$ lung, $n = 4$ other), distributed across American Joint Committee on Cancer (AJCC) Stages I-IV. Participants completed an 8-week, cancer-specific yoga program based in the Integral Yoga tradition. Prior to the intervention, PT evaluations established necessary adaptations for each participant. Pre-post group changes in physical and mental health (anxiety, depression, fatigue, insomnia, etc.) were assessed using the 43-item, Patient Reported Outcome Measurement Information System (PROMIS). Repeated-measures MANOVA compared pre- and postoutcomes contrasting between those whose scores were within normal limits at the start of yoga versus those reporting significant symptoms.

Results: Based on PT evaluation, 68% of participants required some form of adaptation for standing, supine, arm and trunk stretches. Significant improvements in anxiety ($F = 10.21$; $p < .01$), depression ($F = 8.97$; $p < .01$), fatigue ($F = 4.51$; $p < .05$), and insomnia ($F = 11.92$; $p < .01$) were found between groups, with those reporting elevated levels of symptoms at baseline demonstrating significant improvements and those within normal limits at baseline maintaining their function.

Conclusion: This pilot study suggests that yoga is feasible for older veterans following cancer treatment, although significant modifications to yoga poses were necessary to accommodate the wide variety of functional levels. Preliminary findings indicate improvements in anxiety, depression, fatigue, and insomnia in this group of older veteran cancer survivors, a group who previously had expressed little interest in yoga. These results are consistent with those found in previous studies of younger breast cancer survivors.

13. Assessment of Kundalini Mantra and Meditation as an Adjunctive Treatment With Mental Health Consumers

E. Dunbar

Objective: This study examined session-by-session pre- and postevaluation of the benefits of a Kundalini mantra and meditation in a group setting with mental health consumers. The intervention used techniques for the treatment of anxiety and OCD (Shannahoff-Khalsa, 2006).

Methods: Mental health consumers ($n = 26$) participated in a group-based 90-minute Kundalini yoga intervention. Ninety-two pre- and postsession ratings were gathered for subjective units of distress (SUDs), Gunas (*tamas*, *rajas*, *sattva*) state ratings, and pulse/blood pressure scores. In addition, postsession evaluation of the mental and physical benefits of the mantra (9–11 minutes) and extended meditations (11–15 minutes) were recorded on 4-point rating scales.

Results: Pre- to postsymptom reduction was noted for ratings for SUDs scores (.001), lethargy/tamas (.004), and heightened relaxation/sattva (.001) but not agitation/rajas. Significant pre-post differences were also recorded for reduction in systolic blood pressure (.009) and pulse (.002) but not for diastolic blood pressure. Perceived cognitive benefit from mantra was related to pre-post change scores, indicating lower lethargy/tamas (.05) and higher agitation/rajas (.05). Ratings for pre-post change in cognitive distress resulting from extended meditation were correlated with reduction of systolic blood pressure (.001) and pre-post ratings for change in physical distress for systolic (.001) and diastolic (.05) blood pressure.

Conclusion: This study provides preliminary evidence of the benefits of Kundalini yoga mantra and meditation for reduction of physical and cognitive distress with individuals receiving conventional outpatient mental health care.

14. Kundalini Yoga Therapy Versus Cognitive Behavior Therapy for Generalized Anxiety Disorder and Co-Occurring Mood Disorder

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Key Words: yoga, anxiety, mood disorder

Objective: This study was designed to examine the efficacy of Kundalini yoga compared with standard cognitive-behavior therapy (CBT) for reducing symptoms of generalized anxiety disorder (GAD).

Methods: Females ages 18 to 75 years with GAD ($n = 15$) were self-selected to an 8-week Kundalini yoga intervention designed specifically for anxiety, in which mindfulness and meditation practices were integral components. An all-female control group ($n = 15$) was recruited from clinical practice patients who underwent 8 weekly sessions of CBT. Both groups were administered the Symptom 90 Checklist-Revised (SCL-90-R), State-Trait Anxiety Inventory (STAI), Affective Style Questionnaire (ASQ), Resilience Scale (RS), Five Facet Mindfulness Questionnaire (FFMQ), and Penn State Worry Questionnaire (PSWQ) at pre- and postintervention.

Results: The CBT group (67%) had anxiety and depression diagnosis and only 27% had both in the yoga group. The pretest means for all subjects were similar on 8 of the 12 SCL-90-R scales ($p < .05$). Paired t -test with inference for the mean was used to measure pre-post change. Improvements in the yoga group were significant ($p < 0.05$) on the SCL-90-R (Somatization, Interpersonal Sensitivity, Depression, Paranoid Ideation, Global Severity Index, Positive Symptom Distress Index), the FFMQ (Observe, Describe, Nonjudgmental), and the ASQ (Adjusting). The average STAI-S pre-post change for yoga was -10.6 (13.5 SD), whereas it was only -1.8 (11.9 SD) for CBT. The STAI-T change for yoga was -7.47 (10.3 SD), whereas it was -3.3 (5.86 SD) for CBT. The PSWQ change was -6.2 (7.9 SD) for yoga but was -4.6 (7.8 SD) for CBT. In the CBT group, only the Nonjudgmental (FFMQ) change was significant ($p = .011$).

Conclusion: Kundalini yoga is a promising intervention for treating GAD and co-occurring mood disorder and yields reductions in a number of measures, including state anxiety and worry. It also reduced symptoms of nervousness, tension, distress from perceptions of bodily dysfunction, mood disorder, and overall level of emotional distress. It enhanced mindfulness and created a sense of affect stabilization. The major limitation was a research design involving nonrandomized, self-selected treatment assignment.

15. Baseline Differences in Women Versus Men Initiating Yoga Programs to Aid Smoking Cessation: Quitting in Balance Versus QuitStrong

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Key Words: yoga, smoking cessation, complementary therapies

Objective: Cigarette smoking is the leading cause of death in the United States. There are gender differences in barriers to successful smoking cessation (SC), including withdrawal symptoms, weight gain, and negative mood. Yoga has shown promise for SC in women but is untested among men. This study was designed to compare gender differences among adults enrolled in a novel program of either yoga or wellness (control), plus cognitive behavioral therapy for SC delivered 60 minutes twice weekly for 8–10 weeks.

Methods: Adults (age ≥ 18) recruited via radio and Internet who screened eligible (English-speaking, healthy, daily smokers) were enrolled. Certified instructors led yoga sessions at local studios. For men, yoga was later led in-house because of low attendance at studios. Instructor-led wellness sessions covered general health (e.g., sleep, bone health). Baseline variables included smoking rate, potential treatment mediators, and covariates (e.g., smoking and exercise histories, weight concerns, body image, mood, prior withdrawal symptoms).

Results: Baseline samples were $n = 55$ women and $n = 38$ men with the following characteristics (women vs. men): 83%, 95% Caucasian; 65%, 58% completed \geq some college; mean ages = 45.6 (± 8.3), 39.9 (± 13.7) years ($p = 0.025$). On average, women reported significantly greater negative symptoms than did men: withdrawal ($p < 0.01$), anxiety ($p = 0.03$), depression ($p = 0.03$), and body attractiveness ($p < 0.01$). A total of 91% vs. 66% of women were told to quit by a doctor ($p < 0.01$), 32% vs. 13% had disease from smoking ($p = 0.03$), 15% vs. 0% smoked for weight control ($p = 0.01$), and exercised less 63 (± 90) min./wk. vs. 179 (± 151) min./wk. ($p < 0.01$).

Conclusion: Innovative treatments are needed to address barriers to successful SC. Recruiting men and women for a yoga program aimed at SC appears feasible, but there are clear gender differences among participants. Yoga classes were more acceptable to men when they were held in-house. Women were older, reported more health comorbidity, higher negative symptoms, and concerns about body image and weight gain. Findings suggest potential differential mediators of intervention efficacy. The use of a gender-stratified analysis plan may help clarify mechanism(s) for how yoga may support SC treatment differentially by gender.

16. *Pranayam* Practice: Impact on Focus and Everyday Life of Work and Relationships

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Key Words: *pranayam*, focus, everyday life

Objective: The study was designed to research the impact of a regular pranayam yogic-breath practice on focus and attention and a collateral effect on the everyday life of work and relationships. Each of the 9 participants was working in a different profession.

Methods: Subjects were long-term practitioners, from 3 to 20 years, of a daily or consistently regular practice of pranayam. They were in the age range of 45 to 65, and they lived in California between San Jose and Los Angeles.

This was a mixed-method study using semistructured interviews and a Likert Scale. The responses to the interview questions were described in terms of a thematic approach. The mean, median, and mode were derived to describe the responses to the 12-statement Likert Scale.

Results: Each participant reported his/her practice as a routine of 7 to 10 pranayam breath procedures. These were related in a chart to show a relationship to five locations of *prana* in the body. Each subject reported an increase in ability to direct attention and a collateral benefit on work and relationships. Examples included enhanced focus on a work task, holding a conversation without interruption of extraneous thoughts, a good sense of self, less reactive irritable responses, mindfulness and increased awareness, the state of presence, and more peacefulness in everyday life. High levels of agreement on the Likert Scale reported an increase in focus and span of attention; clarity; ability to overcome feelings of suffering and sorrow; physical and mental stamina; ability to experience kindness and compassion; discipline or self-regulation; quality of relationships; preparation for deeper levels of meditation, enhanced performance for the rest of the day; ability to experience deeper insights; ability to make changes; and agreement that sitting in quiet meditation following pranayam increased its impact. The Likert Scale results were then related to situational examples from the transcribed interviews.

Conclusion: The results of this study suggest a strong impact and usefulness of regular pranayam practice on everyday life. This study provides groundwork for future research. Future studies could include adolescents; students, including those at risk; and any persons suffering from trauma, anxiety, diminished focus, or stress.

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17. Participation in a Tailored Yoga Program is Associated With Improved Physical Health in Persons With Arthritis

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Key Words: yoga, rheumatoid arthritis, osteoarthritis, quality of life

Objective: To determine the feasibility, safety, and efficacy of a tailored yoga program for adults with mild–moderate rheumatoid arthritis and osteoarthritis.

Methods: Seventy-five participants were randomized to either an 8-week yoga program or 8 weeks of usual care. Sixty-minute classes were held twice weekly, including poses (*asanas*) that were modified to meet individual needs and limitations, breathing practices (*pranayama*), relaxation, meditation, and chanting. Physical aspects of health-related quality of life (HRQL) were measured at baseline and after 8 weeks using the Physical Component Summary (PCS) of the SF-36 Health Outcomes Survey. Also assessed were selected indicators of physical fitness, psychological functioning, and disease symptoms.

Results: Participants were mostly middle-aged ($M \pm SD$, 52.3 \pm 11.8 yrs) and female (96%). Approximately half were college educated (49%). The sample was diverse, with 55% Caucasians and 39% African Americans. Both RA and OA were equally represented (48% and 52%, respectively) and most had been living with arthritis for many years (9.3 \pm 9.0 yrs). Participants who attended the first class were likely to complete the intervention (84%), attending at least 13 of 16 classes. At Week 8, the mean PCS score in the intervention group improved by more than 25% (37.4 \pm 2.1 vs. 43.8 \pm 1.8, $p < .01$), and the mean score of the control group was essentially unchanged (33.9 \pm 2.0 vs. 35.3 \pm 2.1, $p = .35$). In exploratory analyses, statistically significant improvements were also seen for balance, flexibility, depressive symptoms and positive affect. No adverse events, including worsening of joint symptoms, were associated with regular yoga practice.

Conclusion: Results of this study add to a growing body of evidence suggesting that yoga interventions can be safe and effective for improving physical and emotional well-being in adults with mild-moderate rheumatoid arthritis and osteoarthritis.

18. Effects of Yoga on Blood Pressure: Systematic Review and Meta-analysis

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Objective: Although numerous studies have examined the effects of yoga on blood pressure, meta-analytic reviews are lacking. This study estimated the effectiveness of yoga for reducing blood pressure in adults with or without hypertension and assessed the modifying influence of participant health status, type of yoga intervention, and type of comparison group.

Methods: A systematic review of English-language articles was conducted using MEDLINE, CINAHL Plus, Academic Search Premier, and PsycInfo and other databases. Only peer-reviewed, controlled studies published in English from 1966 to June 2012 were included.

Results: Overall, yoga had a modest but significant effect on both systolic blood pressure (SBP: -3.30 [$-5.26, -1.34$], $p = 0.001$) and diastolic blood pressure (DBP: -2.89 [$-4.40, -1.38$], $p = 0.0002$). However, subgroup analysis demonstrated larger, more clinically relevant differences in effects. Subgroup analyses demonstrated reductions in blood pressure for (a) interventions incorporating three basic elements of yoga practice (postures, meditation, and breathing) (SBP: -8.77 mmHg [$-12.61, -4.93$]; DBP: -7.00 mmHg [$-9.98, -4.02$]) but not for more limited yoga interventions; (b) yoga compared with no treatment (SBP: -6.51 mmHg [$-9.54, -3.48$]) but not exercise; and (c) yoga for participants with hypertension (SBP: -3.85 mmHg [$-6.74, -0.97$]) and other health conditions (SBP: -6.04 mmHg [$-7.16, -4.93$]) but not for healthy participants.

Conclusion: These findings suggest that yoga may offer an effective intervention for reducing blood pressure.

19. A Quasi-experimental Trial of a Yoga-based Intervention to Reduce Stress and Promote Health and Well-being Among Middle School Educators

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Key Words: yoga, schools, stress, prevention

Objective: Teachers experience high levels of stress that put them at risk of burnout. On-site interventions to reduce stress and promote well-being may prevent the negative impacts of

stress on psychological and physiological health. Yoga-based interventions may represent a viable strategy to address this need. The Comprehensive Approach to Learning Mindfulness (CALM) study includes the development and quasi-experimental evaluation of a yoga-based intervention to promote the stress management, health, and well-being of educators.

Methods: The CALM Daily Stress Reduction Program for Teachers is an intervention based in gentle yoga and mindfulness practices and designed specifically to promote health and well-being among teachers and school personnel. The 16-week program involves brief (15–20 minute) sessions of gentle yoga, including somatic breathing practices, gentle stretching exercises, and mindfulness practices, offered 4 days per week before the beginning of the work day. The CALM logic model is informed by the Prosocial Classroom Model (Jennings & Greenberg, 2009) and hypothesizes that the intervention activities will affect educators' social-emotional functioning, including psychological and physiological indicators of stress and well-being and their job-related functioning. The study used a quasi-experimental wait-list control design, with one middle school assigned to the intervention group and one school assigned to the comparison group. Participants included 64 educators (42 teachers, 22 para-professionals, learning support, etc.) from two schools. Educators in the study are predominantly White and include 56 women and 8 men (mean age = 43), with an average of 14 years of teaching experience. This measurement protocol includes quantitative self-reports of stress and psychosocial functioning, physiological data from in-person assessments and saliva collection (4/day x 3 time points), and qualitative focus group data. Self-report and physiological data are being collected at three time points: fall 2012, spring 2013, and fall 2013. This study's innovative measurement design facilitates examination of intervention impacts on physiological indicators related to stress and health (including allostatic load). Implementation is monitored through attendance tracking and two measures of fidelity: daily instructor self-reports and weekly observations.

20. A Systematic Review of Yoga-based Interventions for Objective and Subjective Balance Measures

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Key Words: yoga, balance

Objective: Systematically review the evidence on yoga-based interventions for improving objective and subjective balance outcomes.

Methods: A review of major databases included PubMed, MEDLINE, IndMed, EMBASE, PsychINFO, Cochrane Library, Web of Science, and EBSCO. Reference lists in relevant articles

and published reviews were searched. Key search words were yoga, balance, proprioception, falling, fear of falling, and falls. Included studies were published before June 2012 and were peer-reviewed articles in English that focused on a healthy population, and used objective or subjective balance measures. All yoga styles and study designs were included to broaden the scope of studies evaluated. Two raters individually evaluated the studies by using a modified Downs & Black (DB) quality-rating checklist. Final scores were achieved by consensus. This checklist was selected because it can be applied to nonrandomized trials. Achievable scores ranged from 0 to 27. The total treatment effect size (ES) was calculated when possible.

Results: The search yielded 152 studies and 16 (age range 10–93, $N = 881$) met the inclusion criteria: 4 RCTs, 6 quasi-experimental, 2 cross-sectional, and 4 pre-post, single-group designs. DB quality ratings ranged from 12 to 24 (RCTs), 9 to 20 (quasi-experimental), 4 to 12 (cross-sectional), and 10 to 20 (pre-post), indicating a diverse range of scores regardless of the quality of design. Studies varied by yoga style, frequency of practice, and duration. Outcome measures included static and dynamic balance tests and subjective questionnaires. Eleven studies found positive results ($p < 0.05$) on at least one balance outcome. ES ranged from 0.03 to 2.71 (in 8 studies). ES was not associated with high DB quality rating scores.

Conclusion: Considering the number of yoga studies available, balance is an underused outcome measure for healthy populations. Of the studies conducted in an aging population (>60 yrs, $n = 8$) only three evaluated perceived balance self-efficacy, which is a risk factor for falls. Yoga may improve the sensorimotor component (i.e., proprioception) of balance; however, no study evaluated the sensory contribution to balance in its outcome assessments. This review suggests that yoga may have an overall beneficial effect; however, differences in quality of reporting and study design make it difficult to draw decisive conclusions and suggests research with more probing outcomes is needed.

21. Disparities in Yoga Use: A Multivariate Analysis of 2007 National Health Interview Survey Data

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Objective: Yoga is becoming an increasingly popular exercise activity and treatment for a variety of medical conditions. Although 6.1% of U.S. adults in 2007 reported using yoga in the previous year, yoga users are more likely to be college-educated, White females. We aim to better understand socioeconomic disparities in yoga use and what factors contribute to these differences.

Methods: We conducted a secondary data analysis using the National Health Interview Survey (NHIS) 2007 dataset, the most recent NHIS survey to include a supplemental component on complementary and alternative medicine (CAM). A compiled dataset containing the Person, Adult Core Sample, and Adult Complementary and Alternative Medicine files was analyzed using STATA. To account for survey design effects, all analyses were conducted using *svy*-based commands that adjust for probability sampling units, weights, and strata. Using chi-squared tests of independence, we compared the sociodemographic characteristics and health status of past year yoga users versus non-yoga users. Multivariable regression was used to identify independent factors associated with yoga use, controlling for sociodemographic characteristics and health status.

Results: Based on a sample of 22,624 respondents, we found statistically significant differences ($p < 0.05$) between yoga users and nonusers by sociodemographic characteristics and self-reported health status. Yoga users were more likely to be White (79.0%) than non-White (21.0%), not poor (79.4%) than poor or near poor (20.6%), in excellent or very good health (76.9%) than in good or poor health (23.1%), and have not experienced a delay or no medical care due to cost (14.6%). In our multivariable regression analysis, yoga users were more likely to be female (AOR 3.3, 95% CI = 2.82–3.86), have some college education (AOR 7.9, 95% CI = 4.87–12.75), and to have experienced a delay or no care due to cost (AOR 1.54, 95% CI = 1.25–1.90). Yoga users were less likely to be Black (AOR 0.45, 95% CI = 0.36–0.56), have public health insurance (AOR 0.86, 95% CI = 0.77–0.97), be over age 65 (AOR 0.23, 95% CI = 0.17–0.31), and have poor self-reported health status (AOR 0.22, 95% CI = 0.16–0.30).

Conclusion: Relative to socially advantaged groups, yoga is underused by low-income, less educated minority groups. Given the growing body of research supporting the health benefits of yoga, there is a need for initiatives to increase access among underserved populations.

22. Implementing Yoga Therapy Adapted for Older Veterans Who Are Cancer Survivors

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Key Words: yoga, cancer, older adults, veterans

Objective: Describe the implementation of a yoga therapy program for older cancer survivors in a Veterans' Administration healthcare setting. Particular focus was given to the qualitative analysis of adaptations used to safely deliver yoga to this complex population.

Methods: Fifteen participants with a diagnosis of cancer who completed their first course of treatment were recruited from a VA tumor registry to participate in an 8-week group yoga session. A physical therapist and yoga instructor conducted comprehensive physical preassessments of yoga session participants prior to the start of the group. As a result of these evaluations, individualized yoga adaptations and restrictions were created and documented. Two 75-minute classes were offered weekly. Classes consisted of group check-in, awareness practice, breathing practice, *asana*, and relaxation. After each class, the yoga instructor systematically documented session content, changes in teaching methods, and any further adaptations and restrictions noticed in class. Class progress was monitored in conference calls at least twice during each 8-week session. After the end of the session, participants were interviewed for their feedback on the class experience. Researchers also interviewed the yoga instructor at the conclusion of the session. A qualitative analysis of all documentation and interview results was completed to identify common modifications and restrictions made to yoga for this population.

Results: Results of the qualitative analysis revealed that substantial changes were necessary to both the standard yoga curriculum and general teaching methods. Particularly noteworthy was the wide variety of physical ability levels and the need for highly individualized modifications. The instructor observed improvements in pain, range of motion, balance, and breathing. Students also reported a greater sense of emotional well-being.

Conclusion: Unique modifications and adaptations to standard yoga curricula must be considered for individuals in this population. Preassessment by a physical therapist and yoga instructor appeared to yield useful recommendations for yoga group class planning and implementation.

23. Randomized, Controlled Trial of Yoga for Women With Major Depressive Disorder: Decreased Ruminations as Potential Mechanism for Effects on Depression?

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Key Words: yoga, depression, rumination

Objective: Yoga appears to have clinical relevance as an adjunctive therapy for individuals with depressive symptoms. Ruminations, or excessive negative perseverative thoughts, are classic symptoms in women with depression and may predict development of depressive episodes. This randomized, controlled study examined the effects of a community-based gentle Hatha yoga intervention compared with a health-education control activity in women with major depressive disorder.

der (MDD) who had persistent depressive symptoms despite the usual care (antidepressant and/or psychotherapy) for depression.

Methods: Women with a diagnosis of MDD and with residual depression symptoms despite usual care treatment were recruited from the community and randomized to receive either 8 weeks of group yoga classes plus home-based practice ($n = 15$) or group health-education (HE) classes plus home-based readings ($n = 12$). All participants continued their usual care for depression during the study. The primary measures were depression (Patient Health Questionnaire-9, PHQ9) and ruminations (Ruminations on Sadness Scale, RSS). Follow-up qualitative interviews were conducted at completion of the 8-week classes.

Results: Twenty-seven women (mean age 43 ± 15.6) participated in the study. Retention rates were higher in the yoga group (80%, $n = 12$) than in the HE group (50%, $n = 6$). Multilevel models revealed that participants in both groups had a significant decrease in depression scores over time ($p < .05$), such that the mean depression score decreased from a “moderately severe” level to a “minimal” level of depression, per PHQ9 criteria, in 8 weeks. The yoga group had a unique trend ($p = .08$) toward decreased ruminations when controlling for baseline stress. Qualitative data support these findings whereby the yoga group participants stated yoga was most helpful for minimizing stressful, persistent negative thoughts.

Conclusion: These data suggest that yoga may be a feasible and effective adjunctive treatment for individuals with MDD who continue to have depressive symptoms despite the usual care. Decreased ruminations may be an underlying mechanism for the effects of yoga in this population. Further large-scale research is warranted.

24. Yoga Beyond the Metropolis: A Yoga Telehealth Program for Veterans

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Key Words: yoga, veterans, telehealth, rural health, access to care

Yoga has grown in popularity over the past several years in major metropolitan areas. A few regional VA medical centers offer yoga to local veterans through special programs such as the CA WRIISC Yoga Wellness program at the VA Palo Alto Medical Center. The Palo Alto hospital is part of a large health care system with several smaller community-based outpatient clinics (CBOC) intended to bring “VA care closer to home.” These clinics also offer real-time clinic-based video telehealth (CVT) to provide access to specialty programs not available at the smaller clinics. Recently, chair-based yoga classes were made available to veterans from local CBOCs through the CVT program at the VA Palo Alto Health Care System. The yoga

teacher is located in a specially equipped room at the local VA, and class is broadcast to the community clinics in real time by using secure video conferencing equipment (V-Tel). The instructor is able to make suggestions about alignment and pose modifications safely and effectively through V-Tel. To date, 41 veterans have been referred and 87 yoga contact hours have been logged from clinics in Stockton, Fremont, and San Jose, CA. Monterey and Modesto are scheduled to begin classes soon. No adverse events have occurred, and veterans report receiving benefits from the class, such as increased strength and flexibility and reduced stress. The program is growing and is expected to expand in the near future to provide yoga targeted to specific groups, such as female veterans and veterans from specific combat eras. This project demonstrates that yoga classes can be provided safely and effectively to veterans in community settings, with the potential to open the practice of yoga to a whole new group of veterans.

25. Yoga Practice Frequency, Relationship Maintenance Behaviors, and the Potential Mediating Role of Relationally Interdependent Cognition

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Key Words: yoga, relationship maintenance, cognitive interdependence

Objective: Research to date has primarily examined yoga as a therapy for conditions such as angina, back pain, and depression. Less research addresses how yoga affects the most prevalent condition in the lives of human beings: social relationships. Simultaneously, the impact of yoga on cognition (particularly among the ill or elderly) has been an increasing focus of research. This study examined how yoga affects both social relationships and cognition. More specifically, it examined how willingness to accommodate (respond constructively and inhibit negative responses) in the face of negative social interaction varies as a function of the frequency of yoga practice. It also examined whether this association is mediated by cognitive interdependence (overlap between mental representation of “self” and “other”).

Methods: Participants ages 19 to 70 years were recruited from wellness centers located in Kingston, Jamaica, where yoga classes and other classes (e.g., cycling, dancing, aerobics) are offered. The frequency of their yoga practice and other physical activities was assessed. The outcome measures were Rusbult, Johnson, & Morrow’s (1986) Exit-Voice-Loyalty-Neglect Accommodation Scale and Aron, Aron, & Smollan’s (1992) Inclusion of Other in the Self (IOS) Scale.

Results: Regression analyses showed that the frequency of yoga practice positively and significantly predicted willingness to

accommodate ($p = .01$), and the frequency of other physical activities did not. Perhaps most interesting, the frequency of yoga practice was particularly associated ($p = .03$) with inhibition of the response exit (e.g., behaving unpleasantly or driving others away). The frequency of yoga practice was not uniquely associated with either constructive (voice/loyalty) “type” of response; rather, it was marginally associated ($p = .08$) with the shared variance between them or a generally positive response bias. However, cognitive interdependence did not mediate any of these relationships.

Conclusion: These data demonstrate that regular yoga practice may play a significant role in the healthy functioning of our social relationships. Future research should be dedicated to examining other cognitive mechanisms/pathways. For example, mindfulness (MAAS; Brown & Ryan, 2003) may mediate the relationship between regular yoga practice and constructive responses in contexts such as those assessed in this study.

26. Effects of Medical Yoga in Quality of Life, Blood Pressure, and Heart Rate in Patients With Paroxysmal Atrial Fibrillation

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Key Words: paroxysmal atrial fibrillation, medical yoga, quality of life, blood pressure, heart rate

Objective: Yoga has been shown to have effects on cardiovascular diseases and quality of life. Paroxysmal atrial fibrillation is a common heart arrhythmia. Many individuals with this condition feel poorer subjective quality of life when the arrhythmia occurs. The aim of this study was to investigate whether medical yoga has an effect, as part of treatment, on subjective perceived quality of life, blood pressure (BP), and heart rate (HR). **Methods:** Eighty patients with diagnosis paroxysmal atrial fibrillation were randomized to usual treatment and yoga ($n = 40$) or with only the usual treatment ($n = 40$). We used medical yoga specifically designed for patients with cardiovascular diseases, which focuses on deep breathing in movements. The yoga program was carried out on the basis of a yoga expert once a week for 1 hour, in 3 months. The usual treatment consists of, if necessary, pharmaceutical, cardio version, and ablation. BP, HR were measured and the patients' own perception of quality of life was evaluated with two health-related questionnaires before the intervention and after 3 months.

Results: Patients in the yoga group reported improved health on the EQ-5D VAS scale ($p = 0.006$). According to SF-36, the yoga group reported improved health in physical quality of life (PCS; $p = 0.01$) and mental quality of life (MCS; $p = 0.02$). In the yoga group the systolic BP decreased significantly ($p = 0.03$) to 132 mmHg compared with that of the control group, where the

systolic BP increased to 141 mmHg. The diastolic BP was equal between groups (yoga $M = 83$, respective control group $M = 84$ mmHg) at baseline. Diastolic BP decreased significantly ($p = 0.007$) after 3 months in the yoga group ($M = 77$ mmHg), compared with the control group where the diastolic BP increased ($M = 87$ mmHg). HR decreased significantly ($p = 0.02$) in the yoga group (64 beats/min to 60 beats/min) compared with the control group (65 beats/min to 69 beats/min).

Conclusion: Medical yoga with light movements, deep breathing, and relaxation leads to subjective improvement of quality of life, lower blood pressure, and lower heart rate. These effects may be of importance in that medical yoga can be a complementary treatment method for patients with paroxysmal atrial fibrillation.

27. Yoga During School May Promote Emotion Regulation Capacity in Adolescents: A Group Randomized, Controlled Study

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Key Words: yoga, adolescence, physical education, school, emotion regulation

Objective: Self-regulation develops dramatically during adolescence. Optimal self-regulation, specifically of emotions, may be important for minimizing mental health disorders that are often rooted in adolescence. Thus, adolescence may be a sensitive preventive window. We proposed that yoga may promote adolescent emotion regulation.

Methods: American high school students who registered for physical education classes (PE) were randomly assigned by class to regular PE or Kripalu yoga-based classes instead of PE. The yoga group underwent ~28 classes 2–3 times/week for one semester. Two semesters of classes were conducted during the 2010/2011 school year. Both groups completed validated self-report questionnaires before and after the yoga program, including the Difficulties in Emotion Regulation Scale (DERS). Sample size was 135 (72 yoga, 63 PE).

Results: Pre/post differences were statistically significant ($p < 0.05$) for Awareness and Goals subscales in the yoga group. Trends ($0.05 < p < 0.06$) were observed for the total score and the Awareness subscale between groups, and the total score within yoga. Controls were statistically unchanged on all measures: total score (0.89 ± 11 ave \pm sd change score, post minus pre); Awareness (0.32 ± 5.0), Clarity (0.38 ± 3.7), Goals (-0.79 ± 3.4), Impulse (0.27 ± 3.2), Nonacceptance (0.73 ± 4.6), and Strategies (-0.016 ± 4.4). In contrast, yoga participants improved (lower scores) over baseline for: total score (-3.6 ± 15.5), Awareness (-1.1 ± 4.7), and Goals (-1.4 ± 4.1). Similar to

controls, yoga participants were statistically unchanged on Clarity (-0.44 ± 2.9), Impulse (-0.041 ± 4.3), Nonacceptance (0.47 ± 4.2), and Strategies (-0.85 ± 5.2).

Conclusion: Preliminary results indicate that yoga may improve emotion regulation during adolescence; specifically, emotional awareness and the ability to engage in goal-directed behavior. Although promising, some of these results were trends to be replicated with larger sample sizes and designs to evaluate how yoga's influence on adolescent emotion regulation may moderate/mediate psychosocial well-being.

28. Integrated Yoga Therapy in a Single Session as a Stress Management Technique in Comparison With Other Techniques

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Key Words: yoga, integrate, stress management, workers, autogenic training

Objective: Yoga, derived from an ancient Indian science, is an integrated approach to health of the body, mind, and spirit and includes various kinds of modern stress management techniques, such as cognitive structure, breathing, exercises, relaxation, meditation. Although integrated yoga therapy as a stress management technique requires about 1 week, we are often asked for one-time sessions for students or workers. The aim of this study was to assess the benefits of an integrated yoga program in a single session in comparison with other techniques.

Methods: School employees were randomized to the yoga group (YG; $n = 75$) or the other techniques group (OTG; $n = 75$). We administered the program as a one-time session for 3 hours, as a component of a stress management education program. The program included psychological education to understand stress concepts, feedback on the results of the GHQ to recognize themselves, and a massage session by an expert to allow the subjects to experience relaxation. In addition, stress management techniques, based on theory and practice, to help cope with stress were included for the two groups: integrated yoga intervention for the YG, and paired massage, stretching, and autogenic training for the OTG. Evaluations were performed to assess the cognitive indicators of comfort that are necessary in stress management programs (Ishihara, 2007), by using 10-point scales concerning the physical and mental aspects, at three time points: immediately after the subjects arrived at the facility, after experiencing a massage by experts, and after learning about the stress management techniques.

Results: There were no significant differences in the characteristics between the two groups at baseline. Comparison of the scores on each of the evaluation scales by two-way ANOVA showed significant differences between the two groups in interaction and main effect on both scales covering the physical and

mental aspects. The OTG showed a kind of low awakening similar to sleeping. In the YG, the subjects experienced not only comfort but also cheerfulness, became keenly aware of their body parts, and felt a reduction in the severity of aches. Immediately after the stress management program in both groups, almost everyone wanted to practice the techniques in daily life.

Conclusion: Results suggest that the one-time integrated yoga intervention session is acceptable as a stress management program for Japanese school employees who are typically not interested in yoga.

29. Effects of a Classroom-based Yoga Intervention on Stress and Attention in Second and Third Grade Students

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Key Words: yoga, children

Objective: This study investigated the effects of a classroom-based yoga program on attention and stress in second- and third-grade students.

Methods: Salivary cortisol concentrations and accuracy, response time, and alerting effects measured by the Attention Network Test for Children (ANT-C) were assessed according to the following timeline on the first (Wk1) and last (Wk10) day of a 10-week yoga intervention that included a weekly 30-minute yoga class led by a registered yoga teacher, using curriculum from the Yoga 4 Classrooms® manual.

Saliva samples were collected via passive drool technique and analyzed in duplicate for cortisol concentrations via enzyme immunoassay (Salimetrics, State College, PA). Paired *t*-tests compared cortisol concentrations before and after the ANT-C (S1 vs S2) and a single yoga session (S1 vs. S2 and S3) at both Wk1 and Wk10. Baseline cortisol (S1) and ANT-C outcomes were also compared between Wk1 and Wk10 to assess longitudinal effects of the intervention. Data are reported as mean \pm standard deviation, alpha level $p = 0.05$.

Results: There were no significant differences between any ANT-C parameters at Wk1 vs Wk10. In second graders only, S1 cortisol was significantly lower at Wk10 compared with Wk1 (0.095 vs. 0.149 ug/dL, $p = 0.02$). S2 cortisol was significantly lower than S1 at both Wk1 and Wk10 in second (Wk1: 0.094, vs. 0.149; Wk10: 0.07 vs. 0.095 ug/dL, both $p < 0.01$) and third graders (Wk1: 0.094 vs. 0.137; Wk10: 0.114 vs. 0.143 ug/dL, both $p < 0.01$). S3 cortisol was significantly lower than S1 at Wk1 and Wk10 in both second and third graders (all $p < 0.01$), but there were no differences between S3 and S2 (all $p > 0.05$).

Conclusion: ANT-C parameters were not different after the 10-week yoga intervention. However, the interindividual variability was large; more habituation to the test prior to data collection

and/or a more sensitive measure of attention is warranted. Higher salivary cortisol concentrations observed before the ANT-C test (S1) might be associated with preperformance anxiety and/or the natural circadian rhythm of cortisol. There was no acute effect of yoga on cortisol concentrations. The potential longitudinal effect observed in the second graders should be interpreted cautiously because the study lacked a control group to confirm that the lower Wk10, S1 cortisol resulted from the yoga intervention per se.

30. Improving Memory, Attention, and Executive Function in Older Adults with Yoga Therapy

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Key Words: yoga, memory, attention

Objective: There are very few published studies of the effect of yoga on cognition in older adults. A previous study of a yoga class intervention failed to show improvement in this population. The purpose of this pilot study was to evaluate the effectiveness of a comprehensive, individualized yoga therapy program for improving memory, attention, and executive function in older adults.

Methods: Adults ages 60 and older were recruited from the University of New Mexico Clinics and the general population through flyers and advertisements. Yoga therapy was implemented by a yoga therapist trained in the Krishnamacharya Healing and Yoga Foundation. The intervention consisted of applying several tools of yoga including postures, breathing exercises, gestures, chant, relaxation, intention, and diet recommendations. Each person was given an individualized program to perform at home daily and an optional weekly group class to have their practice reviewed. They met with the therapist a minimum of 4 times individually over a 3-month period. Primary outcomes included measures of memory (Hopkins Verbal Learning Test), attention and executive function (Trail Making Test). A secondary outcome measure included a pilot questionnaire for well-being and human development from a yogic perspective (Pancamaya Assessment and Screening Test - PAST). Self-reports on a variety of parameters, including sleep, energy, pain, appetite, stress, and emotions, were also assessed using Likert scales. Either the Wilcoxon test or a paired *t*-test was used to compare pre-and postintervention scores.

Results: Participants included 11 women and 1 man, ages 60–81 years. There was no significant difference in measures of memory, attention, and executive function. However, there was significant improvement in self-reported sleep quality (2.1 [1.0] vs 2.8 [0.7]) (pre vs post mean, *SD*) $p = 0.031$, energy levels (2.7 [0.8] vs 3.3 [0.5]) $p = 0.016$, and pain (4.2 [2.7] vs 2.5 [1.9]) $p = 0.011$. There was also significant improvement in the

Pranamaya subscale of the PAST scale (10.8 [1.9] vs 8.3 [0.9]) $p = 0.003$, as a result of increased breathing practices and improvement in sleep quality.

Conclusion: While no benefit in cognition was measured, this comprehensive individualized yoga therapy program improved sleep quality, reduced pain, and increased energy levels. These results should be explored further using standardized, validated questionnaires for these outcomes.

31. Reasons for Starting and Continuing Yoga

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Key Words: yoga, reasons for practice

Objective: Yoga is becoming increasingly popular and has been shown to be an efficacious intervention for many conditions, producing myriad adaptive outcomes. However, there is very little information regarding people's reasons for starting or continuing yoga. This study was designed to obtain preliminary data regarding the reasons individuals start and maintain a yoga practice.

Methods: A national sample of yoga practitioners, including 380 yoga students and 160 yoga teachers ages 18–64 years, completed a battery of questionnaires online. Questionnaires included a checklist of reasons for starting and continuing yoga practice and type of yoga practiced most frequently.

Results: We found that yoga student practitioners primarily began practicing yoga for (a) exercise (18.4%), (b) flexibility (15.8%), and (c) stress relief (13.7%). However, 61.9% of yoga student practitioners reported that their reasons for continuing yoga were different from reasons why they first started yoga. The most commonly reported primary reason for continuing yoga was spirituality (21.9%). In fact, 23.7% of those who changed their reason for starting to continuing yoga reported that they continued instead because of spirituality. This pattern generally also held for yoga teachers, with reasons for starting yoga being (a) exercise (21.2%), (b) stress relief (19.9%), and (c) depression/anxiety relief (9.6%). A full 85.4% of teachers continued yoga for reasons different from those they started with. For yoga teachers, the top reason for continuing yoga was spirituality (42.6%, 31.6% of those who changed). The pattern also held for different types of yoga, with the exception of Iyengar yoga, for which flexibility was listed as the primary reason for starting yoga (24.4%).

Conclusion: These data demonstrate that individuals primarily start a yoga practice for exercise and stress relief, but for many, spirituality becomes their primary reason for continuing to practice. This suggests that practitioners are drawn to yoga for more physical reasons, yet end up discovering even more attractive spiritual benefits of yoga.

32. Yoga and Stress Management May Buffer Against Sexual Risk-Taking Behavior Increases in College Freshmen

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Key Words: yoga, sexual risk taking, health

Objective: Yoga has been shown to be an efficacious intervention for health and outcomes. However, no research to our knowledge has examined a yoga intervention's effects on sexual risk-taking behavior, especially in a college population in which sexual risk taking is prevalent. This study was designed to obtain preliminary data regarding the change in sexual risk-taking behavior in female, first-year undergraduates during the course of an 8-week intervention that included a yoga group, cognitive behavioral stress management (CBSM) group, and a wait-list control group.

Methods: Thirty participants, mean age 18, were recruited from undergraduate women entering their first year at a large public university. The study occurred during 8 weeks of the participants' first semester at the university. Inclusion criteria included no more than four lifetime yoga classes and no exercise-related contraindications. Participants were randomly assigned to one of two treatment conditions: yoga ($n = 8$) or CBSM ($n = 8$). A passive wait-list control group ($n = 14$) comprised those with scheduling constraints. Data were collected at baseline (T1) and postprogram (T2), and analyses were conducted on change scores (T2-T1). Measures administered via Qualtrics' online survey interface included two items used to assess sexual risk-taking behavior that have been used in previous studies (Quinn & Fromme, 2010).

Results: Using t -tests, we found that sexual risk-taking behavior increased over time in the wait-list control group ($p < .10$), yet remained the same in the yoga group ($p < .10$) and decreased in the CBSM group ($p < .10$). A one-way ANOVA and post-hoc tests demonstrated significant group differences between the wait-list control group and the CBSM group ($p < .10$).

Conclusion: These data suggest that, though sexual risk-taking behavior increased in the wait-list control group over the course of the 8-week intervention during the participants' first semester at the university, a yoga intervention may offer a buffer against this increase and a CBSM program may even be able to decrease sexual risk taking. Limitations that may reduce the generalizability of these findings include the low number of participants and significance at the $p = .10$ level.




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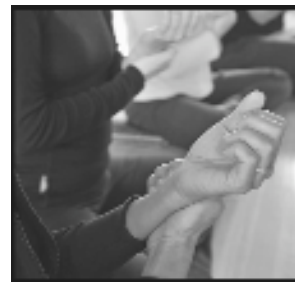
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33. Whole-systems Ayurveda and Yoga Therapy for Obesity: Outcomes of a Pilot Study

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Objective: The CDC reports that 37% of adults and 17% of children in the United States were obese in 2009–2010, regardless of gender. Conventional medical approaches have demonstrated limited success in the treatment or prevention of obesity. A recent review of clinical trials of yoga with weight-related outcomes found that yoga therapy is frequently effective for promoting weight loss and/or improvements in body composition.

Methods: Ayurvedic lifestyle and diet modification enhance, contextualize, and reinforce yoga therapy as a treatment paradigm for obesity, with shared goals of somatic and psychospiritual wholeness/balance. Yoga is a whole-practice therapy that emphasizes tailored treatments and multitarget therapies. Its application and outcomes are multifactorial and complex. A whole-systems (WS) Ayurveda and Yoga therapy intervention was designed to create integrated, sustainable lifestyle change with minimal practitioner intervention. WS research provides the methodological tools to accurately record therapeutic approaches and outcomes associated with yoga therapy.

Results: Twelve participants ages 18–70 years with body mass index between 25 and 45 enrolled in a 3-month WS Ayurveda and Yoga therapy protocol for obesity, including thrice-weekly yoga classes and bimonthly Ayurvedic clinician visits. Participants were yoga novices who met dual diagnosis criteria of BMI 25 < 45 and a predetermined Ayurvedic constitution/imbalance profile associated with simple obesity. Follow-up outcomes at 3 and 6 months postintervention (PI) measured the sustainability of change. The intervention protocol was standardized but flexible, allowing for tailored treatments. Biomedical and Ayurvedic outcomes were collected, including adherence to dietary recommendations, yoga class attendance, and home yoga practice. Unique data collection instruments were designed to collect Ayurvedic outcomes.

Conclusion: Average weight loss, baseline to PI, was 6.5 lbs. Average weight loss increased to 10 lbs. at 3-month PI. Eating and exercise self-efficacy scores increased from baseline to PI and maintained at 3-month PI. Perceived Stress Scale scores improved from baseline to PI and maintained at 3-month PI. Water intake and elimination increased and appetite decreased. Collection of Ayurvedic outcomes did not increase data collection burden. Unique Ayurvedic outcome instruments were designed to increase awareness of diet and lifestyle. Participant satisfaction averaged >90%.

34. Women's Phenomenological Experiences of Exercise, Breathing, and the Body During Yoga for Smoking Cessation Treatment

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Key Words: yoga, smoking cessation, qualitative analysis

Objective: Smoking cessation is difficult: quitting smoking leads to withdrawal symptoms, craving, weight gain, increased negative affect, and perceived stress. Yoga may be an effective aid to smoking cessation, because it reduces stress and negative affect. Yoga that incorporates moderate-intensity aerobic exercise may attenuate weight gain and reduce withdrawal symptoms and craving. This analysis sought to understand the phenomenological effects of yoga during smoking cessation, including experience of exercise, breathing, stress, and craving.

Methods: Fifty-five women participated in a pilot study of yoga as complementary therapy for smoking cessation. Participants were randomized to 8 weeks of group-based cognitive-behavioral therapy (CBT) for smoking cessation and yoga classes ($n = 32$) or 8 weeks of CBT smoking cessation and a wellness control ($n = 23$). Yoga included *pranayama*, meditation, 45 minutes of flowing asanas and savasana. Primary outcomes showed CBT smoking cessation+yoga participants had a greater 7-day abstinence rate, both at the conclusion of the intervention (40.6% vs 13.0%) and at 6 months (18.8% vs 13.0%), and also showed reduced anxiety and improvements in perceived health and well-being, compared with that of controls. For this qualitative analysis, four focus groups were conducted with 20 participants in the yoga group, who were audio recorded and transcribed. Thematic analysis focused on descriptions of yoga as exercise, breathing, and bodily sensations, including craving.

Results: Mean age: 43.8 years; 75% White, 10% African American, 15% mixed race (10% were also Hispanic); 30% had a college degree; 35% a high school diploma. Baseline smoking rate was 16.5 cigarettes/day. Participants described yoga as a physically challenging form of activity that made them sweat and stretch. Many participants indicated yoga is different than other forms of exercise, and most reported deliberate use of yogic breathing to cope with cigarette craving and stress. Several described other effects on the body, including relaxation, calmness, and an increased sense of well-being.

Conclusion: The deliberate coupling of physical activity with breathing and stress reduction may make yoga a particularly effective adjunct for smoking cessation. Additional information is needed to further understand whether and how yoga acts as an effective complementary treatment for smoking cessation and to explore if different forms of yoga might have different effects.

35. Mindfulness as a Tool for Trauma Recovery: Examination of a Gender-responsive Trauma-informed Integrative Mindfulness Program for Female Inmates

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2. Harvard School of Public Health

Key Words: mindfulness, trauma, yoga

Objective: A growing evidence base supports the connection between trauma and disease. Research suggests that mindfulness practices such as yoga and meditation can lead to neurological and physiological changes that may counter the impact of trauma and promote health and well-being. Women in the U.S. prison system suffer a disproportionate burden of physical and emotional traumas and may benefit from a gender-responsive, trauma-informed mind-body program. This study examined the implementation and effectiveness of the gender-responsive Trauma Informed Mind Body (TIMBo) program delivered to inmates at a women's prison in Massachusetts. Based on a train-the-trainer model, TIMBo is an eight-module, accessible, research-based curriculum that includes mind-body practices and tools to support long-term trauma recovery.

Methods: The TIMBo pilot study was conducted with 14 women over 8 weeks in a women's prison. Research staff administered pre- and postsurveys and collected qualitative data through individual interviews and focus group discussions.

Results: Background information of the participants included the following: 88% had a history of domestic violence; more than 50% had a history of self-injury and/or suicide attempt; 75% had a history of physical abuse; more than 60% had a history of sexual abuse. Following completion of the program, women reported less stress and physical symptoms and were more likely to be aware of how emotions manifest in the body. There was a significant increase in the use of mindfulness-based tools following the program. Prior to participating, women used on average 2.7 tools; after completion women used 4 on average. All the women shared tools learned with others, including fellow inmates, and half shared with their children. In addition, 100% of women believed others would benefit from the program, and more than 50% indicated they would be interested in facilitating the program.

Conclusion: On the basis of participation in the TIMBo program, women reported increased access to mindfulness-based tools, and participants were significantly more likely to use these tools to manage distress. Data indicate that TIMBo is a promising program that supports mitigation of traumatic symptomology among female inmates and addresses the need for sustainable, quality, and equitable service provision among underserved female populations.

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36. Yoga After Stroke Leads to Multiple Physical Improvements

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Key Words: rehabilitation, yoga, stroke

Funded by the Department of Veterans Affairs, Health Services Research and Development, Quality Enhancement Research Initiative, Project 09-195, PI: Schmid

Objective: Assess the impact of therapeutic yoga on range of motion, strength, and walking capacity in people with chronic stroke.

Methods: Forty-seven individuals with chronic stroke were recruited and randomized 3:1 to yoga or wait-list control (usual care). The yoga group completed 1-hour yoga sessions twice weekly for 8 weeks. Yoga was taught by a yoga therapist and included modified physical postures in seated, standing, and supine positions and yoga breathing and bilateral movements, concluding with relaxation.

Assessments before and after the 8 weeks included flexibility via passive range of motion (PROM) for the hamstrings and active range of motion (AROM) for hip flexion, cervical rotation, and cervical lateral flexion; strength with the chair to stand and arm curl and hip flexion manual muscle test; and walking capacity with the 6-minute walk test. We compared groups using a *t*-test/Mann Whitney. We used paired *t*-tests/Wilcoxon nonparametric tests to compare baseline and 8-week data.

Results: The average age of participants completing the study was 64; 76% were male and 60% were White. There were no differences in demographics or outcomes between the yoga and control groups. There were no improvements in the wait-list control group ($n = 10$). In the yoga group ($n = 37$), improvements were found in flexibility with PROM and AROM, arm curl, and walking capacity. The chair to stand test and hip flexion AROM did not change ($p > .05$).

Conclusion: Research findings suggest therapeutic yoga improved flexibility, arm strength, and walking capacity for individuals poststroke. Such improvements may be related to improved quality of life. Therapeutic yoga requires repetitive, slow, and sustained muscle activation that may contribute to these findings. Further testing is warranted because these findings are preliminary.

37. Tele-Yoga in Patients With Chronic Obstructive Pulmonary Disease and Heart Failure: A Mixed-methods Study of Feasibility, Acceptability, and Safety

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Key Words: yoga, video conferencing, heart failure, COPD

Background: Chronic obstructive pulmonary disease (COPD) and heart failure (HF) are major causes of morbidity and mortality worldwide. Yoga may be particularly relevant to COPD/HF because both are characterized by dyspnea. Patients with both COPD and HF are often frail, home-bound, and unable to attend yoga classes.

Objective: To determine the feasibility, acceptability, and safety of an 8-week home yoga intervention conducted via simplified multipoint video conferencing (Tele-Yoga) in patients with COPD and HF.

Methods: Patients with COPD and HF were enrolled in 16 one-hour yoga classes that included individually modified asana, pranayama, and meditation. Feasibility was assessed by attendance, enjoyment, difficulty of classes (rated 0 = low to 10 = high) and barriers to participation. Acceptability was assessed via qualitative interviews at study exit, analyzed thematically. Safety was assessed by vital signs (VS), pulse oximetry, dyspnea intensity, affective response by using a modified Borg scale, and self-report of ER visits and adverse events. A registered nurse remotely monitored classes for safety. Mean scores for postclass measurements were calculated.

Results: Eight patients were enrolled (age 71 ± 15 years; FEV1 $49 \pm 23\%$ predicted; female = 4); 6 attended 15 ± 2 Tele-Yoga classes. Feasibility was mixed: 2 patients could not establish video stream, 2 did not attend the full series (i.e., 12/16 sessions), and 1 stopped early on 4 occasions for personal reasons. Those who did not attend regularly reported less enjoyment and more difficulty, primarily related to poor video streaming quality or musculoskeletal pain unrelated to yoga. Qualitative data demonstrated good acceptability: patients reported classes helped with relaxation, flexibility, and motivation to practice; however, frustrations with the technology were also reported. Safety was demonstrated by stable VS, low dyspnea ratings, and no ER visits. One patient reported reoccurrence of preexisting shoulder pain.

Conclusion: Tele-Yoga is feasible, acceptable, safe, and potentially beneficial for selected patients with COPD and HF. However, the technology used was problematic, mainly the result of poor video-streaming quality. Further development and evaluation of home-based, real-time interventions is supported and will benefit from evolving and improved technology.

38. Effects of an Ashtanga Yoga-based Health and Wellness Curriculum on Physical and Emotional Well-being, Engagement Toward School, and Academic Performance of K-6 Students

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Objective: Recent research has offered evidence that children who practice yoga have shown improvement in both psychological and physical components, but studies to date have been small in size or have methodological limitations that prompt the need for further research. This study was a randomized, controlled trial of an Ashtanga-based health and wellness curriculum across a full K-6 school district.

Methods: Half of the approximately 5,000 K-6 students across an entire school district were randomized (by school) to receive a 10-week health and wellness intervention that included Ashtanga yoga to assess the effects of the program on student physical and emotional health and wellness, student attitude and engagement in school, student learning and academic performance, and school climate. Data from students, parents, classroom teachers, yoga teachers, and school administrators were collected across all experimental and control schools before, during, and after the intervention. Data analyzed for this study included measurements of student body-mass index and resting heart rate for all students K-6; engagement, attitude, and school climate surveys of students in Grades 3-6; nutrition, engagement, and school climate surveys of parents of students in Grades K-6; behavior and school climate surveys of teachers of students in Grades K-6; district behavior, attendance, and suspension records for students in Grades K-6; and district test score data for students in Grades 2-6.

Results: As of the time of submission of this proposal, data collection had just ended. Results from the study will be presented during the conference.

Conclusion: As of the time of submission of this proposal, data collection has just ended. Results from the study will be presented during the conference.



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39. Yoga as a Facilitator for Participation Following an 8-week Yoga for Individuals With Chronic Stroke

M. Van Puymbroeck, K. K. Miller, N. Schalk, A. A. Schmid

Clemson University, Roudebush VA Medical Center, Heartland Yoga, Indiana University Indianapolis

Key Words: participation, stroke, yoga

Funded by the Department of Veterans Affairs, Health Services Research and Development, Quality Enhancement Research Initiative, Project 09-195, PI: Schmid

Objective: Participation, as defined by the International Classification of Functioning, Disability, and Health, is involvement in a life situation. The objective of this study was to observe changes in participation for individuals with chronic stroke who completed an 8-week yoga intervention.

Study Population and Methods: Inclusion criteria included that subjects had to (a) be at least >6 months poststroke; (b) have completed all rehabilitation; and (c) be able to meet minimum physical and cognitive standards. The 8-week yoga intervention was led by a yoga therapist, with twice-weekly meetings for 1 hour. The intervention involved seated, standing, and supine *asanas*, breathing, and meditation. Five focus groups were conducted with the 29 individuals who completed the yoga intervention. All focus groups were digitally recorded and transcribed verbatim, and each group lasted between 30 and 75 mins. Through use of constant comparative techniques, primary and secondary themes were identified in the data and supportive quotes extracted to describe each theme.

Findings and Conclusion: Themes that emerged related to participation included increased independence, increased social interaction, and increased recreation engagement. Subjects described facets of their life that improved as a result of feelings of increased independence associated with the yoga intervention. They described changes in their physical body that encouraged them to try activities they had not engaged in independently since their stroke, such as showering, chopping wood, and doing yard work. As one woman stated, “I took a shower for the first time in 2 years [choking up]. You cannot believe how meaningful that is to me.” Subjects also stated that they had felt isolated following their stroke, and that engagement in the yoga intervention introduced them to new friends who encouraged each other. Subjects stated that their ability to engage in recreation activities, such as golf, driving for pleasure, and reading, improved their quality of life and made them feel like their “old” selves. As a result of engaging in this yoga intervention, subjects stated that their ability to participate or engage in life situations was enhanced. They felt stronger, both mentally and physically, which allowed them to take more risks than they had previously, leading to feelings of increased independence, social interaction, and recreation engagement.

40. Standardization of Design and Reporting of Yoga Interventions for Musculoskeletal Conditions: A Delphi Approach

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Key Words: yoga, Delphi, musculoskeletal conditions

Objective: Evidence suggests yoga may result in clinically relevant improvements in pain and functional outcomes across a range of musculoskeletal conditions. However, heterogeneity in the components and reporting of clinical yoga trials impedes generalization of study results. To address this challenge of heterogeneity and enhance transparency and reproducibility of yoga trials, standardization of components of these complex interventions is necessary. The aim of this study was to use a Delphi survey to develop a set of core components of yoga interventions for musculoskeletal conditions.

Methods: A systematic review was conducted to identify research teams involved in the implementation and teaching of yoga trials for musculoskeletal conditions. Fifty-seven individuals were invited to participate in the Delphi survey; 38 accepted, and 3 new individuals were recruited via snowballing, resulting in 41 panelists from six countries. The 3-round Delphi was conducted via electronic surveys. Round 1 consisted of an open-ended question to generate items for consideration as core yoga intervention components. These items were rated for importance for inclusion in the Delphi list in Round 2. Any items not reaching consensus were forwarded to Round 3 for rerating.

Results: Thirty-six participants (88%) completed the survey. Round 1 generated 348 comments, which were analyzed using thematic analysis and grouped into 49 items for rating in Round 2. Thirty-one items not reaching consensus were subsequently rerated in Round 3. Final consensus was reached on 33 items, grouped under five themes: (a) defining the yoga intervention: intervention parameters, minimum parameter values, appropriateness of the intervention; (b) types of yoga practices; (c) delivery of the yoga protocol: instructors, best practice, resources; (d) outcome domains; and (e) reporting of the intervention. Comments regarding items not reaching consensus highlighted areas of divergence among researchers regarding some parameter values and reporting of the interventions.

Conclusion: The 33-item Delphi list provides a reference tool for standardization of best practice in the design and reporting of future clinical yoga trials for musculoskeletal conditions. Use of this list will address the challenge of balancing a need for standardization with the ability to adapt interventions to the specific clinical population and outcome measures being studied and the style of yoga being taught.

41. Creating S.P.A.C.E. Through Yoga: Africa Yoga Project Teachers Promote Personal Transformation, Peaceful Communities, and Purpose-filled Service

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Key Words: Community intervention, empowerment, yoga

Objective: Yoga is increasingly used as an intervention to improve physical and mental health and promote a sense of strength and empowerment. The Africa Yoga Project (AYP) is an organization that builds on these goals by attempting to increase access to the tools of self-determination for individuals living in the “slums” of Nairobi and other Kenyan communities profoundly affected by trauma and poverty following the post-election violence in 2008. AYP aims to achieve this goal by training individuals to become yoga teachers to foster income generation, public service, and community development. This study was designed to elucidate the experiences of AYP yoga teachers and whether and how AYP has affected their lives and communities.

Method: Seven one-on-one interviews were conducted with AYP teachers who offer traditional classes and no-fee and low-fee community classes with underserved and marginalized populations (e.g., women in prison, orphaned children, people with HIV/AIDS). Teachers with leadership roles were selected on the basis of their ability to speak to the personal and community impact of AYP. Interviews took place at AYP headquarters in Nairobi, Kenya, and lasted 45–60 mins. Audiotaped interviews were transcribed and analyzed using qualitative content analysis, from which five primary themes arose.

Results: Participants’ reports of their experiences in AYP were overwhelmingly positive. Negative comments universally related to ways in which they wished for more resources to expand AYP’s reach beyond Nairobi. Five major themes, referred to as S.P.A.C.E. themes, arose from the data: (a) safety and stability, (b) personal growth, (c) action, (d) cultural and experiential diversity, and (e) empowerment.

Conclusion: Results demonstrate how AYP provides a unique opportunity to its members. Participants described feeling more stable in their lives, with increased ability to take action, create meaningful connections, and empower others. Findings also suggest that yoga can be an effective intervention for individuals and communities to promote peace and reconciliation, improve physical and mental health, and bring economic opportunity to low-income people. This presentation will address potential implications, including opportunities for creating sustainable programs to empower individuals and communities and provide tools for self-determination through yoga.



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