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A Group-Based Yoga Therapy Intervention for Urinary Incontinence in Women: A Pilot Randomized Trial

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Abstract

Objective—To examine the feasibility, efficacy, and safety of a group-based yoga therapy intervention for middle-aged and older women with urinary incontinence.

Methods—We conducted a pilot randomized trial of ambulatory women aged 40 years and older with stress, urgency, or mixed-type incontinence. Women were randomized to a 6-week yoga therapy program (N=10) consisting of twice weekly group classes and once weekly home practice or a waitlist control group (N=9). All participants also received written pamphlets about standard behavioral self-management strategies for incontinence. Changes in incontinence were assessed by 7-day voiding diaries.

Results—Mean (\pm SD) age was 61.4 (\pm 8.2) years, and mean baseline frequency of incontinence was 2.5 (\pm 1.3) episodes/day. After 6 weeks, total incontinence frequency decreased by 66% (1.8 [\pm 0.9] fewer episodes/day) in the yoga therapy versus 13% (0.3 [\pm 1.7] fewer episodes/day) in the control group (P=0.049). Participants in the yoga therapy group also reported an average 85% decrease in stress incontinence frequency (0.7 [\pm 0.8] fewer episodes/day) compared to a 25% increase in controls (0.2 [\pm 1.1] more episodes/day) (P=0.039). No significant differences in reduction in urgency incontinence were detected between the yoga therapy versus control groups (1.0 [\pm 1.0] versus 0.5 [\pm 0.5] fewer episodes/day, P=0.20). All women starting the yoga therapy program completed at least 90% of group classes and practice sessions. Two participants in each group reported adverse events unrelated to the intervention.

Conclusions—Findings provide preliminary evidence to support the feasibility, efficacy, and safety of a group-based yoga therapy intervention to improve urinary incontinence in women.

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Introduction

Nearly one third of women aged 40 years and older experience urinary incontinence,^{1,2} a condition associated with depression, social isolation, physical inactivity, falls and fractures, and institutionalization.³⁻⁶ Although a variety of clinical therapies for incontinence are available, many have limitations that decrease their efficacy, safety, and/or accessibility, particularly for older women who are at greatest risk of developing incontinence. Behavioral treatment strategies such as pelvic-floor muscle exercises and bladder training can be highly effective in treating incontinence, but can be difficult for some women to learn without in-person, individualized instruction.⁷⁻¹³ Anti-cholinergic medications are moderately effective in reducing urgency-type incontinence, but are associated with bothersome side effects, resulting in high rates of discontinuation.¹²⁻¹⁴ For stress-type incontinence, surgery is an effective second-line treatment, but many women do not desire or are not candidates for surgical intervention.¹⁵ Given these limitations, there is a need for treatment alternatives that are not only effective, but also accessible and well-tolerated by the large number of incontinent women in the community.

One complementary behavioral intervention that may offer therapeutic benefits for urinary incontinence is yoga. As a set of physical and mental practices designed to promote overall health and wellbeing, yoga has been incorporated into behavioral treatment programs for a variety of chronic health conditions including low back pain, cancer-related symptoms, and hypertension,¹⁶⁻²¹ and has the specific potential to improve incontinence through several mechanisms. By promoting awareness and control over individual muscle groups through the practice of specific yoga postures, yoga can be used to help women identify and strengthen their pelvic floor muscles without traditional pelvic floor rehabilitation. With its focus on deep breathing and mindful meditation, yoga can also be useful in reducing anxiety, perceived stress, and associated autonomic nervous system imbalance,²²⁻²⁸ which have been identified as risk factors for urgency incontinence in multiple clinical and epidemiologic studies.²⁹⁻³¹ Additionally, regular practice of yoga postures can improve and maintain general lower extremity muscle strength, balance, and conditioning,^{32,33} which have been shown to protect against incontinence in older women.^{34,35} In contrast to most clinical incontinence therapies, yoga can be practiced by women without continuous or ongoing supervision by healthcare practitioners, thus offering a potentially accessible and cost-effective self-management strategy for a large number of women in the community.

To explore the feasibility, safety, and efficacy of yoga as a behavioral treatment for incontinence, we conducted a pilot interventional trial of a 6-week group-based yoga therapy program in ambulatory middle-aged and older women. Our goals were to determine whether women with clinically frequent incontinence can be safely taught to practice yoga to improve their symptoms, and to gather preliminary data on the effects of this yoga therapy intervention on incontinence frequency, bothersomeness, and impact on quality of life.

Materials and Methods

Participants

Participants were recruited from the San Francisco Bay Area from August to October, 2012, using a combination of newspaper advertisements, flyers posted in local community centers and businesses, and direct recruitment from clinician offices. To be eligible, women had to be at least 40 years of age, report experiencing incontinence for at least 3 months, and document at least 7 episodes of incontinence on a screening 7-day voiding diary,^{36,37} with at least half of those episodes being stress-type or urgency-type. Women were excluded if they had severe mobility limitations that would prevent them from participating in a yoga therapy program (inability to walk up a single flight of stairs or at least two city blocks on level ground or an inability to stand up from a supine position unaided within 10 seconds), or if they reported formal yoga instruction within the past year or any prior use of yoga specifically to treat incontinence.

Other exclusion criteria included pregnancy within the past 6 months; current urinary tract infection or hematuria (assessed by urine dipstick testing) or history of 3 or more urinary tract infections in the past year; major neurologic condition such as stroke, multiple sclerosis, or Parkinson's disease; history of congenital defect leading to incontinence, fistula in the bladder or rectum, pelvic cancer or radiation, or interstitial cystitis or chronic pelvic pain; current symptomatic pelvic organ prolapse; body mass index >35 kg/m²; or prior surgery to the urinary tract. Participants also could not have used practitioner-supervised behavioral, pharmacological, or other clinical treatments (e.g., pessary) for incontinence within the past 3 months, or be planning to initiate new clinical incontinence treatments during the study. All women provided informed consent before enrollment.

Randomization and blinding

Eligible participants were randomly assigned by computer in a 1:1 ratio to participate in a 6-week group-based yoga therapy program (yoga therapy group) or receive no yoga instruction for 6 weeks followed by a gift certificate for local yoga studio classes (control group). Randomization was stratified by incontinence type (stress- or stress-predominant versus urgency- or urgency-predominant). Participants were aware of their group assignment, but outcomes data from voiding diaries and questionnaires were abstracted by analysts who were blinded to group assignment.

Incontinence self-management pamphlet

At randomization, all participants were given a written pamphlet with instructions about standard behavioral self-management strategies for improving bladder control. The pamphlet provided basic patient-directed information about the definition and etiology of incontinence, instructions for performing pelvic floor strengthening exercises, and techniques for urge suppression and bladder retraining. This pamphlet was designed to be consistent with usual first-line behavioral care of incontinence in the community and to reflect expected concomitant use of these techniques with yoga in clinical practice. No additional education about incontinence was provided in either the control group or the yoga therapy group.

Yoga therapy program

The yoga therapy program was designed to provide formal instruction and practice in a variety of yoga postures and techniques that were selected by the study's two yoga expert consultants (Judith Hanson Lasater, PhD, and Leslie Howard) for their potential to improve incontinence and their appropriateness for the target population. The study program was based primarily on Iyengar yoga, a form of Hatha yoga that is known for its potential therapeutic applications, has been used successfully for other health-related indications,^{22,24,38-44} and differs from other Hatha yoga styles (power yoga, bikram yoga) in ways likely to maximize both efficacy and safety in older women with incontinence: 1) emphasis on precise anatomical and postural alignment during practice of yoga postures; 2) incorporation of props to minimize risk of injury and accommodate those with lower strength or flexibility; and 3) emphasis on mindful awareness during practice of postures rather than rapid cycling through postures.

The study program focused on a core set of 8 postures that are widely used in Hatha yoga practice, are potentially generalizable to yoga instruction across the country, and can be adapted for women of all ages, including those with decreased flexibility or mobility: Tadasana (mountain pose), Utkatasana (chair pose), Trikonasana (triangle pose), Malasana (squat pose), Viparita Karani Variation (legs up the wall pose), Salamba Set Bandhasana (supported bridge pose), Supta Baddha Konasana (reclined cobbler's pose), and Savasana (corpse pose). While teaching these postures, instructors emphasized specific ways of practicing each posture in order to foster awareness of pelvic floor structures and increase control over the pelvic floor muscles, in addition to improving general fitness and conditioning and promoting mindfulness, deep breathing, and relaxation.

Women assigned to the yoga therapy program attended an introductory 90-minute orientation session that provided a general introduction to structure of the yoga therapy program, principles of Iyengar yoga, and use of yoga props. They were then scheduled to participate in two 90-minute group yoga classes per week for 6 weeks, led by an experienced, certified instructor as well as an assistant. Participants were also instructed to practice yoga at home for at least one additional hour per week and to record the dates and duration of practice in a home yoga diary. Participants were given a limited set of yoga props (mat, belt, and block) to take home and a manual with written descriptions and pictures depicting each of the key yoga postures featured in the classes. Tips on how to practice each posture safely and comfortably and how to adapt each posture to improve incontinence and pelvic floor function were also provided in the manual.

Waitlist control

Women randomized to the control group did not attend group yoga therapy classes and were instructed to avoid outside yoga instruction for 6 weeks. At the end of the 6 week study, control group participants were given a \$180 gift certificate for yoga classes at a local yoga studio as well as a limited set of home yoga props (block, mat, and strap) to take home.

Clinical efficacy and quality of life outcomes

The primary clinical efficacy outcome was change in the average frequency of any urinary incontinence episodes from baseline to 6 weeks, assessed by 7-day voiding diaries in which women recorded each time they leaked urine and classified their leakage episodes as stress-type (associated with coughing, sneezing, lifting, or physical activity), urgency-type (associated with a strong need or urge to void), or other-type (not associated with physical activity or with an urge to void).^{45,46} Secondary efficacy outcomes included changes in the frequency of urgency-type incontinence, stress-type incontinence, any daytime incontinence, any night-time incontinence, daytime voids in the toilet, and night-time voids in the toilet from baseline to 6 weeks, also assessed by voiding diaries.

Changes in the bothersomeness and impact of incontinence and related urinary tract symptoms were evaluated using the Urogenital Distress Inventory 6 (UDI-6), a 6-item questionnaire that assesses subjective bother associated with incontinence-related symptoms;⁴⁵ the Patient Perception for Bladder Condition (PPBC), a single-item questionnaire assessing the degree to which participants consider their bladder condition to be a problem;^{46,47} and the Incontinence Impact Questionnaire Short Form (IIQ-7), a 7-item measure of the impact of incontinence on physical activities, emotional health, travel, and social relationships.⁴⁵ In addition, participants completed a close-out questionnaire at the end of the study in which they indicated their overall satisfaction with the change in their urine leakage on a 5-point Likert scale, ranging from “very unsatisfied” to “very satisfied.”

Yoga process outcomes

Within the yoga therapy group, adherence to group yoga classes and home practice sessions were monitored using attendance logs and participant diaries. Participants’ success in learning to perform yoga postures and techniques was assessed at the 6-week visit using a self-administered Yoga Posture Self-Efficacy Questionnaire, modeled after a measure used in prior clinical yoga studies,⁴⁸ in which women rated their confidence in their ability to successfully execute each of the 8 yoga postures featured in the study program on a 5-point Likert scale (“not at all,” “slightly,” “moderately,” “very,” or “extremely” confident). For a more objective measure of participants’ success in learning study techniques, a yoga expert consultant (Ms. Howard) also observed participants during the last yoga class and rated each participant’s ability to perform each of the 8 postures (“not at all,” “slightly,” “moderately,” “very,” or “extremely” successful). Additionally, a close-out satisfaction questionnaire asked women to indicate at the 6-week visit how easy it would be to continue practicing yoga to improve their incontinence on a 5-point scale ranging from “very difficult” to “very easy.”

Safety monitoring

During a 3-week telephone call and a 6-week clinic visit, coordinators asked participants about any negative changes in their health and recorded any reported negative changes as adverse events on standardized forms. Adverse events were considered “serious adverse events” if they met the standard definition of resulting in death, disability, or hospitalization. Participants were also encouraged to call study staff to report any negative changes in their health between scheduled calls or visits.

Statistical analyses

Demographic and clinical characteristics of participants randomized to each group were compared using t-tests for continuous variables and Fisher's exact tests for categorical variables. To evaluate adherence to the yoga therapy program, the proportion of women in the yoga therapy group completing at least 11 and 12 of the total 12 group classes and at least 5 and 6 of the total 6 recommended home practice hours were examined. To evaluate the success of the program in teaching women to practice yoga, we examined the proportion of women who were at least "moderately" or "very" confident that they could perform all of the 8 core postures, as well as the proportion who were rated by the yoga expert consultant as performing all 8 postures at least "moderately" or "very" successfully after 6 weeks.

To evaluate clinical efficacy, we examined changes in the frequency of any urinary incontinence, stress- and urgency-type incontinence, daytime and night-time incontinence, and daytime and night-time voids in the toilet in the yoga therapy versus control group using analysis-of-variance (ANOVA) models, controlling for baseline frequency of these outcomes. For evaluation of quality-of-life outcomes, additional ANOVA models examined 6-week changes in scores on the UDI-6, IIQ-7, and PPBC measures of the bothersomeness and impact of incontinence, adjusting for baseline scores on these instruments.

Questionnaire scores were transformed as needed to address skewness. Safety analyses compared the proportion of participants with: 1) one or more adverse events, 2) one or more adverse events that were considered likely to be associated with treatment, and 3) serious adverse events between intervention groups, using Fisher's exact tests.

All study procedures were approved by the institutional review board of the University of California-San Francisco (IRB #12-09389). This trial was registered in the clinicaltrials.gov database (NCT01672190).

Results

Baseline characteristics

Of the 92 women who were screened for eligibility by telephone, 32 attended an in-person screening visit, 23 completed a 7-day voiding diary and returned for a baseline visit, and 19 were confirmed eligible and randomized to the yoga therapy group (N=10) or control group (N=9) (Figure 1). After randomization but before the start of the yoga therapy program, one yoga therapy participant dropped out of the study citing worsened health, leaving 9 participants in each group.

The mean (\pm SD) age of participants was 61.4 (\pm 8.2) years, and the mean number of incontinence episodes per day was 2.5 (\pm 1.3). Compared to controls, women randomized to yoga therapy had slightly lower average diastolic blood pressure, higher average number of daytime and total voids in the toilet per day, and lower average scores on the IIQ-7 questionnaire, but did not differ significantly with respect to frequency of total, stress-type urgency-type, daytime, or night-time incontinence, nor scores on the UDI-6 or PPBC measures (Table 1).

Yoga adherence and self-efficacy

Of the 9 participants who started the yoga therapy program, all 9 (100%) attended at least 11 of the recommended 12 organized yoga classes, and 6 (67%) attended all 12 classes. All 9 (100%) reported completing all 6 hours of recommended home yoga practice. At the 6-week visit, 9 (100%) participants indicated on their Yoga Posture Self-Efficacy Questionnaires that they were at least “moderately” confident and 5 (56%) indicated that they were at least “very” confident about their ability to execute all 8 core yoga postures (Table 2). The expert yoga consultant rated 100% of these participants as being at least “moderately” successful in performing all 8 poses, with 2 (22%) being at least “very” successful. Three (33%) participants felt it would be very easy and 5 (56%) felt it would be moderately easy to continue practicing yoga to improve their incontinence (Table 2).

Clinical efficacy and quality-of-life outcomes

After 6 weeks, the mean (\pm SD) total frequency of incontinence decreased by an average of 66% from baseline in the yoga therapy group compared to only 13% in the control group ($P=0.049$; Table 3). Stress incontinence frequency decreased by an average of 85% in the yoga therapy group, compared to a mean *increase* of 25% for the control group ($P=0.039$). No significant differences in reduction in frequency of urgency incontinence, total daytime or nighttime incontinence, or daytime or night-time voids in the toilet were detected ($P<0.05$ for all; Table 3).

Compared to controls, yoga therapy group participants also demonstrated greater improvement in the subjective bothersomeness of their urinary tract symptoms as measured by scores on the UDI-6 questionnaire ($P = 0.004$), but no significant treatment effects on scores on the IIQ or PPBC measures were detected (Table 3). In the close-out satisfaction questionnaire, all 9 (100%) yoga therapy group participants who completed the study reported being at least “very” satisfied with the change in their urine leakage, while in the control group, only one participant was moderately satisfied and 8 reported “no change in satisfaction.”

Safety outcomes

Two participants in each treatment group reported one or more adverse events, with 7 adverse events occurring in total. None of these adverse events were musculoskeletal problems considered potentially related to the study, and none were serious adverse events, as defined by the standard criterion of resulting in death, disability, or hospitalization.

Discussion

In this pilot randomized trial of a group-based yoga therapy intervention, we found that recruiting middle-aged and older women with frequent urinary incontinence was feasible, teaching women to practice yoga to improve their incontinence was achievable and safe, adherence to group yoga classes and home yoga practice was high, and all women were at least moderately successful in learning to practice program-specific yoga postures and techniques after 6 weeks. Furthermore, women the yoga therapy group demonstrated an over 50% greater improvement in both total and stress-type incontinence frequency over 6 weeks,

as well as significantly greater improvement in the bothersomeness of their symptoms, compared to participants who received a behavioral self-management pamphlet alone. These results provide promising preliminary evidence to support yoga as a potentially effective and well-tolerated complementary treatment strategy for urinary incontinence in ambulatory middle-aged and older women.

Despite efforts to improve rates of diagnosis and treatment for incontinence in the community, studies show that many women with incontinence fail to obtain treatment from a health care provider, either because they are not asked about or do not report their symptoms, do not have access to a healthcare provider who is willing and able to treat incontinence, or are unwilling or unable to use conventional medical or surgical treatments.⁴⁹⁻⁵² Yoga may offer a useful alternative treatment strategy for women who do not have access to incontinence specialists or pelvic floor physical therapists, elect not to use standard behavioral, pharmacologic, or surgical therapies for incontinence, or cannot tolerate these therapies. Yoga may also provide a way for women to supplement or enhance clinical treatment through group classes and home practice sessions based outside of the clinical setting. Since yoga can be taught and practiced at many locations without continuous or ongoing supervision by healthcare providers, it offers a potentially cost-effective, community-based management strategy for incontinence, provided that it can be taught in a standardized way and with appropriate attention to patients' clinical and safety needs.

Based on a systematic search of English-language studies in PubMed and EMBASE conducted on July 29, 2013 using the search term "yoga" with the terms "urinary incontinence," "urinary stress incontinence," "urge incontinence," or "pelvic floor disorders," this is the first published randomized trial of a yoga intervention for treatment of incontinence. Nevertheless, several small uncontrolled studies have examined the effects of yoga-based interventions on incontinence or other urinary tract or pelvic floor symptoms in special populations. In a study of an integrated yoga program in 11 patients with multiple sclerosis resulting in neurogenic bladder, participants reported pre-post improvements in the bothersomeness and impact of their urinary tract symptoms as measured by scores on the UDI-6 and the IIQ-7 questionnaires after 3 weeks of treatment.⁵³ In another uncontrolled study of 9 patients with severe defecation difficulties attributed to puborectalis dysfunction, no meaningful improvements in symptoms were detected after a program of 20 sessions of yogic relaxation and muscle control training.⁵⁴ A few small randomized trials have also examined the effects of other specialized muscle-strengthening interventions such as abdominal muscle training, Pilates exercise, and circular muscle strengthening in women with stress urinary incontinence, but results have not supported the efficacy of these treatments for this indication.⁵⁵

Limitations of this pilot trial include its small sample size, which may have resulted in more unstable estimates of frequency and impact of incontinence, as well as limited study power to detect some clinical outcomes. For example, although we did not detect a significantly greater reduction in urgency incontinence frequency among participants in the yoga therapy compared to the control group, definitive conclusions about differential treatment effects on different types of urinary incontinence cannot be made based on a study of this size.

Additionally, the waitlist control design used in this study did not control for the time that participants in the yoga therapy group spent during group classes and home practice sessions and may have been associated with low expectations of treatment success. Further research is indicated to compare this yoga intervention to other interventions that require a more substantial time investment and offer more plausible therapeutic benefits for women's symptoms. The yoga therapy program used in this study was also relatively short (6 weeks), and we did not assess whether treatment benefits persisted after the end of the program. Finally, this study was limited to ambulatory middle-aged and older women without complex urologic histories, and the efficacy and safety of yoga therapy may differ for more frail elderly women, women with more complicated incontinence, or those with more severe co-morbidities.

Overall, our findings provide preliminary evidence to support the feasibility, efficacy, and safety of a group-based yoga therapy intervention to improve urinary incontinence in ambulatory middle-aged and older women without complicated urologic histories. Future studies involving larger numbers of participants and comparing this yoga therapy intervention to a time-and-attention control intervention are indicated to confirm and extend these findings, assess for differential treatment effects by incontinence type, and evaluate for persistence of treatment effects, as well as examine mechanisms that may mediate the effects of yoga on incontinence.

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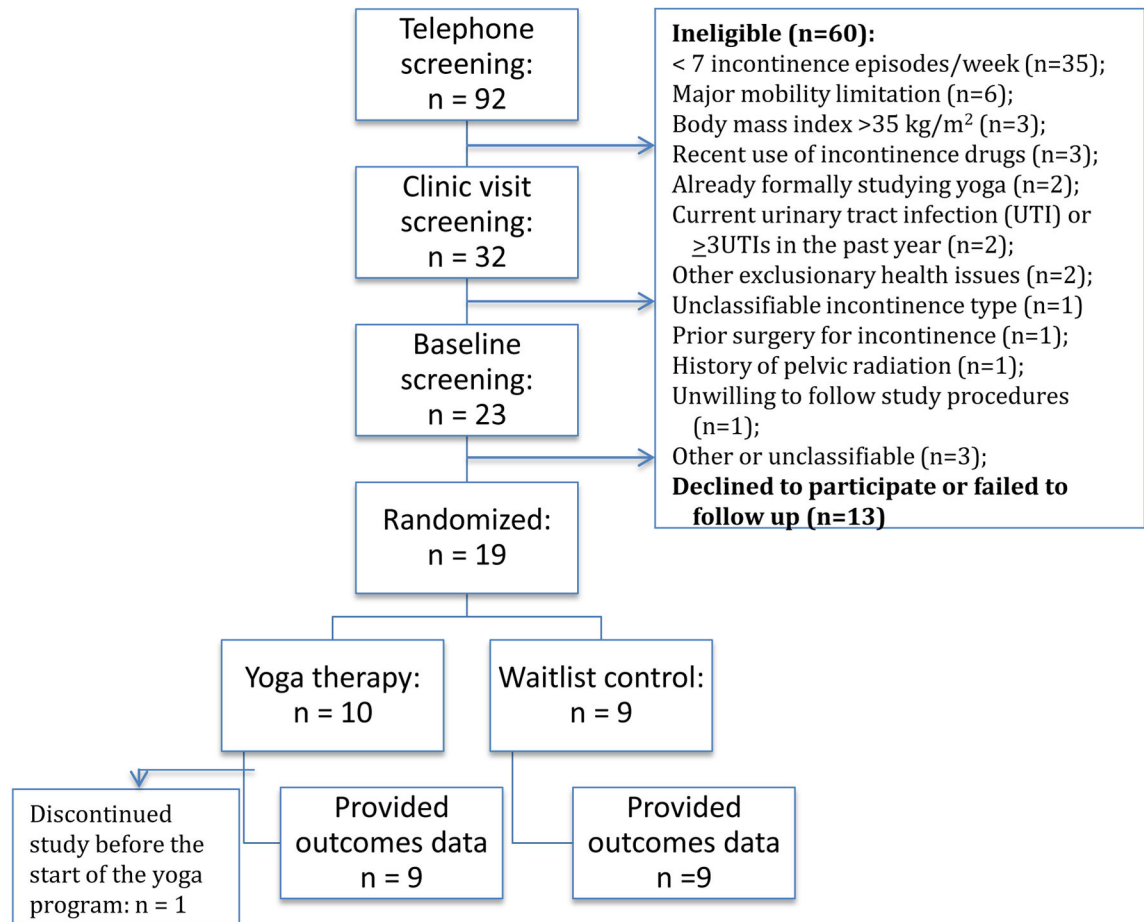


Figure 1. Flow Chart of Participant Recruitment, Screening, Randomization, and Follow-up

Table 1

Baseline Participant Characteristics, by Intervention Assignment

	Yoga Therapy (N=10)	Control (N=9)	P-value ^a
Demographic history			
Age in years	60.5 (±8.4)	62.4 (±8.3)	0.61
White/Caucasian	8 (80%)	4 (44%)	0.17
Married	7 (70%)	4 (44%)	0.37
Gynecologic history			
No menses in the past year	7 (88%)	4 (40%)	0.07
Oophorectomy	0 (0%)	1 (11%)	0.47
Hysterectomy	2 (20%)	1 (11%)	0.88
Health-related habits			
Current smoker	0 (0%)	2 (22%)	0.21
5 alcoholic drinks/week	4 (40%)	3 (33%)	0.76
Physical exam measures			
Body mass index (kg/m ²)	24.7 ± (2.7)	25.8 (±3.8)	0.46
Systolic blood pressure (mmHg)	116.9 (±10.9)	131.2 (±20.4)	0.07
Diastolic blood pressure (mmHg)	68.7 (±6.7)	78.1 (±9.4)	0.02
Clinical incontinence type			
Urgency or urgency-predominant	6 (60%)	6 (67%)	0.78
Stress or stress-predominant	4 (40%)	3 (33%)	
Incontinence frequency (episodes/day)			
Total Incontinence	2.77 ± 1.3	2.16 ± 1.2	0.25
Urgency Incontinence	1.69 ± 1.1	1.21 ± 1.0	0.52
Stress Incontinence	0.93 ± 1.1	0.84 ± 0.8	0.76
Total Daytime Incontinence	2.09 ± 1.1	1.44 ± 0.8	0.24
Total Nighttime Incontinence	0.69 ± 0.7	0.71 ± 0.7	0.82
Frequency of voiding in the toilet (episodes/day)			
Daytime Voids	9.49 ± 1.7	7.40 ± 2.3	0.04
Nighttime Voids	0.74 ± 0.4	0.46 ± 0.5	0.21
Total Voids	10.23 ± 1.6	7.86 ± 2.3	0.02
Bladder-specific questionnaires			
Incontinence Impact Questionnaire (IIQ)	52.3 ± 38.9	104.1 ± 60.0	0.03
Urogenital Distress Inventory-6	1.6 ± 0.5	1.5 ± 0.4	0.82
Patient Perception of Bladder Condition	3.1 ± 0.7	3.1 ± 0.9	0.98

Data are presented as mean (± standard deviation) or as a number (percentage).

^aP-values were calculated using t-tests or Fisher's exact tests, as appropriate.

Table 2

Yoga Adherence and Efficacy Outcomes

	Yoga therapy group participants (N=9)
Adherence to group classes and home practice^a	
Attended all 12 group classes	6 (67%)
Attended at least 11 group classes	9 (100%)
Completed all 6 recommended home practice hours	9 (100%)
Self-reported confidence in performing yoga postures^b	
Very/extremely confident about ability to perform all postures after 6 weeks	5 (56%)
At least moderately confident about ability to perform all postures after 6 weeks	9 (100%)
Independent assessment of participants' ability to perform yoga postures^c	
Rated by expert consultant as being very/extremely successful in executing all postures	2 (22%)
Rated by expert consultant as being at least moderately successful in executing all postures	9 (100%)
Self-assessment of ease of continuing to practice yoga to improve incontinence^d	
Very easy to continue practice	3 (33%)
Moderately easy to continue practice	5 (56%)
Neither difficult nor easy to continue practice	1 (11%)
Moderately difficult to continue practice	0 (0%)
Very difficult to continue practice	0 (0%)

Data are presented as number (percentage).

^a Adherence to group classes was assessed by attendance logs kept the class instructors, while adherence to home yoga practice was assessed by diaries in which participants recorded the dates and times of their home yoga practice.

^b Participants rated their confidence in performing each of the 8 core postures featured in the yoga therapy program on a 5-point Likert scale (not at all, slightly, moderately, very, or extremely).

^c An expert yoga consultant visited the final group yoga class of the program and independently rated each participant's success in performing each of the 8 core postures on a 5-point Likert scale (not at all, slightly, moderately, very, or extremely).

^d Participants in the yoga therapy group were asked to indicate how easy it would be to continue practicing yoga to improve their incontinence at their final (6-week) study visit

Table 3
Changes in Frequency of Incontinence and other Voiding Outcomes Over 6 Weeks, by Intervention Assignment

	Yoga Therapy (N=9)	Control (N=9)	Difference (95%CI) ^a	P-value ^a
Urinary incontinence frequency (episodes/day)				
Total incontinence	-1.84 ± 0.9	-0.27 ± 1.7	-1.40 (-2.79, 0.00)	0.049
Stress incontinence	-0.71 ± 0.8	0.21 ± 1.1	-0.98 (-1.89, -0.06)	0.04
Urgency incontinence	-0.98 ± 1.0	-0.48 ± 0.5	-0.41 (-1.06, 0.24)	0.20
Total daytime incontinence	-1.37 ± 0.9	-0.35 ± 1.0	-0.85 (-1.80, 0.11)	0.08
Total nighttime incontinence	-0.48 ± 0.5	0.08 ± 0.9	-0.58 (-1.26, 0.09)	0.09
Frequency of voids in the toilet (episodes/day)				
Daytime voids	-0.68 ± 1.6	-0.11 ± 1.3	0.01 (-1.45, 1.47)	0.99
Nighttime voids	-0.22 ± 0.4	-0.02 ± 0.3	-0.14 (-0.51, 0.23)	0.43
Total voids	-0.90 ± 1.7	-0.13 ± 1.2	-0.12 (-1.73, 1.48)	0.87
Bladder-specific questionnaire scores				
Incontinence Impact Questionnaire-7	-29.2 ± 28.7	-30.9 ± 44.8	-27.7 (-66.8, 11.4)	0.15
Urogenital Distress Inventory-6	-1.0 ± 0.8	-0.1 ± 0.3	-0.9 (-1.4, -0.3)	0.004
Patient Perception of Bladder Condition	-1.0 ± 1.0	-0.4 ± 0.9	-0.6 (-1.4, 0.2)	0.12

Changes in incontinence and other voiding outcomes are presented as mean ± standard deviation

^a Estimates of between-group differences in outcomes were derived from analysis of covariance models, with adjustment for baseline outcome levels.