Brawijaya Journal of Urology
November 2025, Volume 6, Issue 2

p-ISSN: 2721-4982 **e-ISSN**: 2722-4546
DOI: https://doi.org/10.11594/bjurology.2025.006.02.5

Can Yoga-Based Therapy Improve Urinary Incontinence in Women? A Systematic Review and Meta-Analysis

Lukman Nur Rahman[1,2]*, Muh. Azrief Khaidir Anjar[2], Ilham Suripto Gani[2]

[1]Master Program of Basic Medical Sciences, Faculty of Medicine, Airlangga University, Surabaya, East Java, Indonesia, 60131
[2]Faculty of Medicine, Tadulako University, Lemito Regional Public Hospital, Lemito, Gorontalo, 96468

***Corresponding Author**
Lukman Nur Rahman
Master Program of Basic Medical Sciences, Faculty of Medicine, Airlangga University, Surabaya, Indonesia
Email: luqman.rachman@gmail.com

Introduction. Urinary incontinence (UI) is the involuntary leakage of urine, significantly impacting quality of life, including contributing to depression, sexual dysfunction, and substantial medical, psychosocial, and economic burdens. Aims to evaluate the effectiveness of yoga-based therapy as a treatment intervention for urinary incontinence in women.
Methods. This systematic review followed the PRISMA 2020 guidelines using the PICO framework (population: women with UI; intervention: yoga therapy; control: standard care; outcomes: UI frequency, symptom severity [ICIQ-UI-SF], quality of life [IIQ/UDI-6], and adverse effects). A comprehensive search was conducted in PubMed, ProQuest, Scopus, Cochrane Library, Web of Science, and Google Scholar up to April 1, 2025, using keywords related to yoga and UI. Risk of bias was assessed using Cochrane RoB2, and statistical analysis was performed using R 4.4.3.
Results. Out of 1,926 screened articles, 5 RCTs met the inclusion criteria. Results indicated a significant reduction in symptom severity (ICIQ-SF; MD: -5.6748; 95% CI: -14.3359 to 2.9862; p=0.1991) and improved quality of life (IIQ: MD -1.4795; 95% CI: -18.3035 to 15.3446; UDI-6: MD 3.3937; 95% CI: 0.2439 to 6.5435), despite high heterogeneity (I^2=50.6–97.8%). UI frequency did not show significant improvement (MD 0.7413; 95% CI: 0.0948 to 1.3877; p=0.0246). No serious adverse effects were reported.
Conclusion. Yoga is effective in reducing symptom severity and improving quality of life in women with UI but does not significantly decrease UI frequency. These findings support the consideration of yoga as an adjunct therapy in UI management.

Keywords: efficacy, urinary incontinence, woman, yoga

Introduction

Urinary incontinence (UI) is characterized as the involuntary loss of urine. The prevalence of urinary incontinence advances with age, affecting 58% to 84% of elderly women. The reported prevalence rates exhibit considerable variation attributable to differences in diagnostic criteria and assessment technique. The prevalence is estimated to be between 38% and 55% among women aged over 60 years [1-2].

Factors contributing to urinary incontinence (UI) relate to age, race/ethnicity, body mass index (BMI), parity, smoking habits, diabetes, and a prior history of hysterectomy [1,3-4]. Women having urinary incontinence (UI) often report a reduced quality of life, among issues such as depression and sexual dysfunction, leading to significant value medical, psychosocial, and economic challenges for patients [1,4].

Clinical guidelines generally suggest for conservative therapy as the initial treatment approach before considering invasive interventions, given its minimal risk of adverse effects. Conservative treatments encompass behavioral therapy, physical therapy, and scheduled voiding. Guidelines universally endorse Pelvic Floor Muscle Training (PFMT) for the management of both stress urinary incontinence (SUI) and urge urinary incontinence (UUI), recommending a trial period of three months to assess effectiveness. The European Association of Urology (EAU) specifies that first-line pelvic floor muscle training (PFMT) should encompass both geriatric and postpartum populations [3].

Yoga is a comprehensive practice that integrates physical, mental, and spiritual elements, potentially providing therapeutic advantages for urinary incontinence (UI) through the modulation of physiological mechanisms, including muscle stretching and neuromuscular control, as well as psychological factors. Yoga incorporates breathing techniques, relaxation methods, and muscle control exercises that are thought to enhance the strength of pelvic floor muscles (PFMs). The observed elevation of the pelvic floor during exhalation is believed to improve the strength and tone of these muscles. Figure 1 illustrates several commonly practiced yoga poses designed to rehabilitate the pelvic floor muscles, presented by Kannan et al. [5].

Cochrane review suggested that yoga can be used as an alternative or supplementary approach to pelvic floor muscle training (PFMT) in the management of urinary incontinence (UI). The current empirical evidence is inadequate concerning the efficacy of yoga in the treatment of urinary incontinence. The Cochrane review, citing limited available evidence, advocates for future high-quality clinical trials to assess the efficacy of yoga as a primary or adjunctive intervention in managing urinary incontinence in women [5-6]. Therefore, this systematic review aims to evaluate the effectiveness of yoga-based therapy as a treatment intervention for urinary incontinence in women.

Figure 1. Yoga poses designed to rehabilitate pelvic floor muscles

Materials and Method

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines [7-8]. This systematic review was registered before publication with PROSPERO (CRD420251033272). The study framework followed the PICO model (Population, Intervention, Comparison, Outcome), with the intervention based on yoga therapy in comparison to control or standard care. The main outcomes evaluated were the frequency of urinary incontinence episodes (episodes per day), symptom severity assessed via the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF), and health-related quality of life measured using the Incontinence Impact Questionnaire (IIQ) and the Urogenital Distress Inventory (UDI-6). The review also examined adverse events related to the interventions [3,9].

Search Strategy and Selection Criteria

A systematic search for relevant studies was conducted across multiple scientific databases, including PubMed, ProQuest, Scopus, Cochrane Library, Web of Science, and Google Scholar, up to April 1, 2025. The search utilized a combination of keywords and terms: "Yoga" OR "yoga therapy" OR "yoga intervention" AND "urinary incontinence" OR "stress urinary incontinence" OR "urge incontinence" OR "bladder incontinence." Inclusion criteria include randomized controlled trials (RCTs) comparing yoga therapy with all yoga poses (yoga types) with control interventions or standard care in the treatment of urinary incontinence among women. Only full-text articles published in English were considered. Exclusion criteria included in vitro studies, in vivo or animal studies, non-randomized controlled trials, and case reports.

Data Extraction

All authors (LNR, MAKA, and ISG) undertook independent data extraction. The data extracted comprised study sources, eligibility criteria, methodologies, sample characteristics, interventions, and outcomes, all derived from a standardized data extraction form. The extracted data were subsequently cross-verified for accuracy. Discrepancies were addressed through authorial discussion. In the absence of consensus, an additional author was consulted to address the disagreement, and the final decision was determined by majority vote.

Risk of Bias

The studies were assessed with the Cochrane Risk of Bias 2 (RoB 2) tool, tailored for randomized controlled trials (RCTs). This tool evaluates five domains of bias: (1) bias from the randomization process, (2) bias resulting from

deviations from intended interventions, (3) bias due to missing outcome data, (4) bias in the measurement of outcomes, and (5) bias in the selection of reported results. Since all studies included were randomized controlled trials, no further risk of bias assessment tools were utilized [10-11].

Data Analysis

A summary of each included study is presented in a characteristics table that outlines the following parameters: study authors, publication year, study design, sample size, treatment duration, mean age (±SD), urinary incontinence episode frequency (episodes per day), symptom severity measured by the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-UI SF), and health-related quality of life assessed using the Incontinence Impact Questionnaire (IIQ) and Urogenital Distress Inventory (UDI-6). Data standardization for meta-analysis involved the application of conversion formulas from Luo et al. and Wan et al. to transform median and interquartile range (IQR) data into mean and standard deviation (SD) values. Furthermore, standard error of the mean (SEM) values were transformed into standard deviation (SD) utilizing the Meta-Analysis Accelerator tool (https://ma-accelerator.com/) [12-14].

Statistical analyses were performed using R software, version 4.4.3 [15]. A meta-analysis was performed utilizing the mean difference (MD) for the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-UI SF) and health-related quality of life evaluated via the Incontinence Impact Questionnaire (IIQ) and Urogenital Distress Inventory (UDI-6), accompanied by corresponding 95% confidence intervals. The I^2 statistic was employed to assess heterogeneity among the included studies. A fixed-effects model was utilized in the absence of significant heterogeneity ($p \geq 0.05$ and $I^2 \leq 50\%$). A random-effects model was utilized when significant heterogeneity was identified ($p < 0.05$ or $I^2 > 50\%$). A p-value of less than 0.05 was deemed statistically significant for all statistical tests [16-18].

Result

A comprehensive database search identified a total of 610 articles across various platforms: PubMed (n = 22), Scopus (n = 236), Web of Science (n = 22), ProQuest (n = 250), Cochrane Library (n = 55), and Google Scholar (n = 25). Following a rigorous screening process, five randomized controlled trials (RCTs) were included in the final analysis. Figure 2 presents the PRISMA 2020 flow diagram illustrating the study selection process.

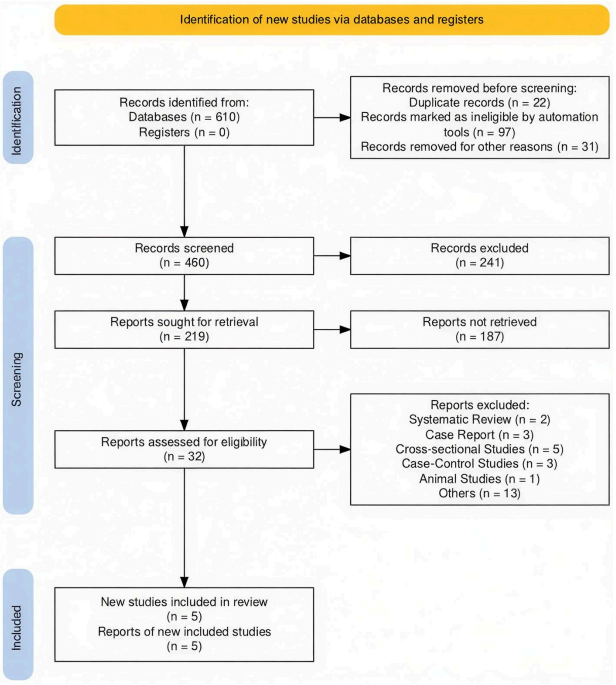

Figure 2. PRISMA flowchart

Study Characteristics and Quality Assessment

Five studies involving 401 patients with IU were included in the meta-analysis. The characteristics of the reported studies are shown in Table 1. The Cochrane Risk of Bias Tools (ROB2) for Randomized Trials were employed to assess the risk of bias. Studies were assessed across five domains: (D1) bias from randomization, (D2) bias from deviations in the intended intervention, (D3) bias from missing data, (D4) bias in outcome measurement, and (D5) bias in the selection of reported outcomes. Each study was classified according to the assessments as exhibiting low risk of bias, high risk of bias, or presenting "some concerns." Two studies demonstrated a high risk of bias, two studies indicated "some concerns," and one study exhibited a low risk of bias. The risk of bias chart and the summary of risk of bias are presented in Figures 3 and 4.

International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF)

The results of the two studies analyzed obtained a total of 108 samples with IU (54 in the

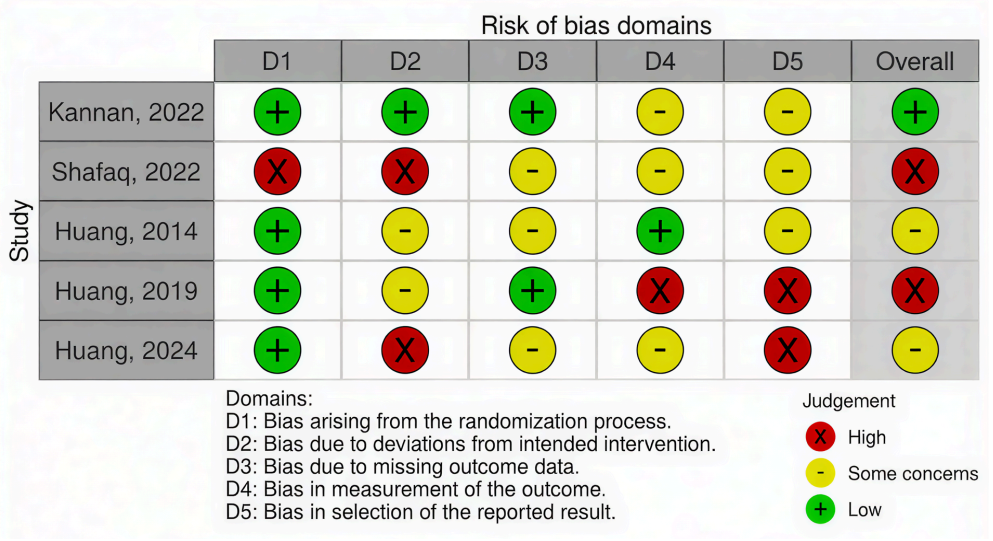

Figure 3. Risk of bias chart and Traffic-light plot

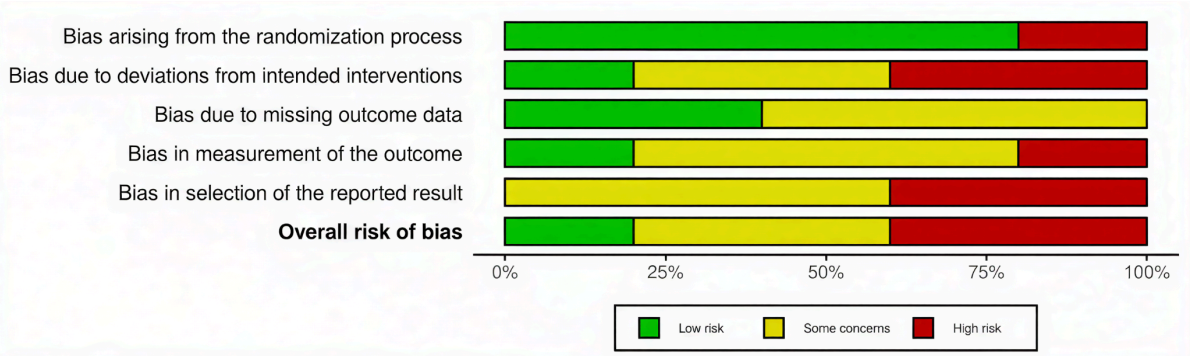

Figure 4. Summary of risk of bias

Table 1. Characteristics of the reported studies

No.	Authors, Year	Study Design	Sample Size (n)	Age (mean ±SD*)	Intervention Duration	Urinary incontinence frequency (mean±SD)	ICIQ-SF* (mean±SD)	IIQ** (mean± SD)	UDI*** (mean± SD)
1.	Kannan, 2022[5]	Randomised controlled trials (RCTs)	20	74.2± 5.37	12 weeks	-	2.44± 2.99	-	-
2.	Shafaq, 2022[20]	Interventional study	88	27.34 ±4.63	8 weeks	-	4± 0.456	-	-
3.	Huang, 2014[21]	Randomised controlled trials (RCTs)	18	60.5± 8.4	6 weeks	1.84±0.9	-	29.2± 28.7	1±0.8
4.	Huang, 2019[22]	Randomised controlled trials (RCTs)	56	65.5± 9.1	12 weeks	2.8±1.25	-	74± 45.31	21±9.37
5.	Huang, 2024[23]	Randomised controlled trials (RCTs)	219	62.7± 8.7	12 weeks	2.27±0.38	-	38.5± 16.69	18.47± 3.98

*ICIQ-SF: International Consultation on Incontinence Questionnaire-Short Form
**IIQ: Incontinence Impact Questionnaire
***UDI: Urogenital Distress Inventory
****SD: Standard Deviation

yoga group and 54 in the control group) showed that the yoga group had a lower mean ICIQ-SF value than the control group with MD Random effect model -5.6748; 95% CI [-14.3359 to 2.9862]; p = 0.1991 while the heterogeneity I^2 = 97.8%; p = <0.0001. Lower mean ICIQ-SF scores indicate improvement or a decrease in the severity of urinary incontinence symptoms. This result shows that the yoga group experienced improvement in urinary incontinence symptoms compared to the control group. The results of the ICIQ-SF forest plot can be seen in Figure 5.

Urinary Incontinence Frequency

The results of the three studies analyzed obtained a total of 293 samples with IU (143 in the yoga group and 150 in the control group) showing that the yoga group had a higher mean value than the control group with MD Random effect model 0.7413; 95% CI [0.0948 to 1.3877]; p = 0.0246 while heterogeneity I^2 = 67.4%; p = 0.0465. This result has a positive MD value meaning that the yoga therapy group is not better than the control group in reducing urinary incontinence frequency. The results of the forest plot of urinary incontinence frequency can be seen in Figure 6.

Incontinence Impact Questionnaire

The results of the three studies analyzed obtained a total of 292 samples with IU (143 in the yoga group and 149 in the control group) showing that the yoga group had a lower mean score of the Incontinence Impact Questionnaire than the control group with an MD Random effect model of -1.4795; 95% CI [-18.3035 to 15.3446]; p 0.8632 while the heterogeneity of I^2 = 50.6%; p = 0.1321. Lower average IIQ (Incontinence Impact Questionnaire) scores indicate an improvement in quality of life or a decrease in the impact of urinary incontinence on patients' activities and well-being. Our results show that the yoga group experienced a greater improvement in quality of life compared to the control groups. The results of the forest plot of incontinence impact questionnaire can be seen in Figure 7.

Urogenital Distress Inventory

The results of the three studies analyzed obtained a total of 292 samples with IU (143 in the yoga group and 149 in the control group) showed that the group undergoing yoga intervention had a higher average Urogenital Distress Inventory score than the control group compared to the control group with MD Random effect model 3.3937; 95% CI [0.2439 to 6.5435]; p 0.8632 while the heterogeneity I^2 = 95.6%; p = <0.0001. A positive MD value indicates that the group undergoing yoga intervention was not better at reducing the Urogenital Distress Inventory score than the control group. The results of the Urogenital Distress Inventory Forest plot can be seen in Figure 8.

Discussion

Our results show that yoga therapy can improve urinary incontinence symptoms, including urinary incontinence frequency and improving quality of life in women with urinary incontinence, as evidenced by a decrease in ICIQ-SF scores. However, our results were not statistically significant and showed high heterogeneity (over 50%). Previous studies have reported that after yoga intervention, there was a significant decrease in urinary tract symptom scores. [6,20] Moreover, a case report stated that after undergoing yoga therapy for 21 days during inpatient treatment, there was a significant decrease in urinary incontinence symptoms in patients [20].

Urinary incontinence has been reported as resulting from physiological dysfunction of the urinary bladder, characterized by bladder hypersensitivity, detrusor overactivity, and impaired detrusor compliance, leading to inadequate bladder distension [1,24]. The underlying inflammation in the urinary bladder is a common pathophysiological process that contributes to the symptoms of UUI. Study findings report that women with overactive bladder symptoms accompanied by UUI show higher serum C-reactive protein (CRP) levels, which is an indicator of inflammation. Increased levels of inflammatory biomarkers were also found in the urinary bladder in women with UUI. Increased urinary proinflammatory cytokines such as interleukin-6 (IL-6) were observed in women with UUI, implying a role for local bladder inflammation in urgency symptoms [25-26].

Yoga therapy can reduce the levels of these inflammatory mediators, and this may occur through activation of the vagus efferent pathway (cholinergic anti-inflammatory pathway). [24-25] Activation of the efferent vagus nerve increases the release of acetylcholine, which inhibits NF-kB and stimulates the STAT3-SOC3 anti-inflammatory pathway via α7 nicotinic receptors on activated macrophages, as well as other cytokine-producing cells, ultimately reducing the synthesis of pro-inflammatory cytokines. A decrease in inflammatory mediators in the bladder will reduce

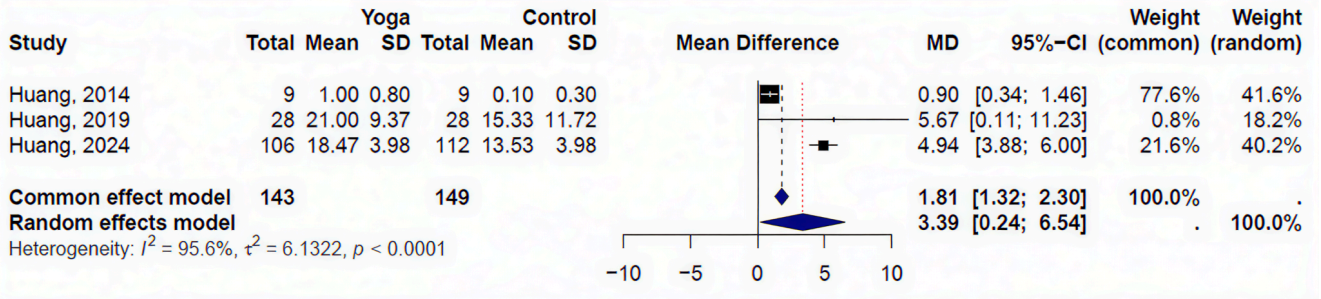

Figure 5. Forest plot of ICIQ-SF

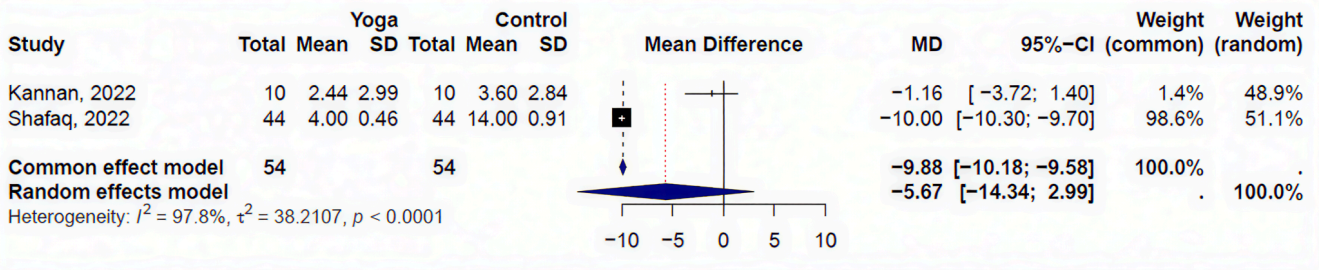

Figure 6. Forest plot of urinary incontinence frequency

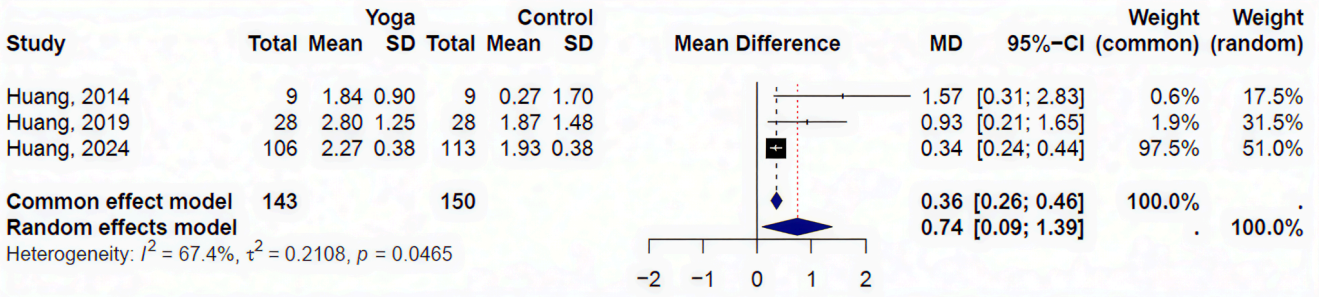

Figure 7. Forest plot of incontinence impact questionnaire

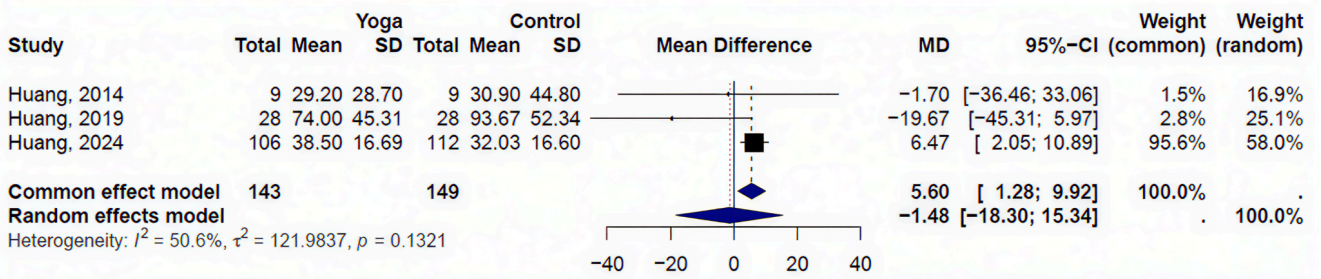

Figure 8. Forest plot urogenital distress inventory

the sensitivity of afferent C fibers and restore the sensitivity of the bladder's sensory nerves. A decrease in the production of inflammatory mediators in the bladder can reduce urgency and incontinence by directly reducing the myogenic activity of the detrusor muscle and/or modulating the sensory pathways involved in mediating the subjective sensation of urgency [25-26].

Additionally, yoga can improve quality of life through its potential effects on depression, stress, and anxiety resulting from urinary incontinence. [28] In individuals with urinary incontinence (UI), yoga may enhance symptoms via a multimodal strategy: Targeting specific muscle groups; enhancing body postural awareness; integrating breathing techniques and meditation to reduce

anxiety and stress; and improving balance and muscle strength are key factors contributing to the pathophysiology of urinary incontinence in women [20,27].

In contrast, yoga did not show significant benefits compared to standard conservative therapy in improving urinary incontinence frequency or urinary incontinence-related quality of life when evaluated using the Urogenital Distress Inventory. The mean difference (MD) values indicate that the yoga intervention group was no better than the standard therapy group in reducing urinary incontinence frequency or UDI scores. This difference was statistically significant ($p < 0.05$) and also showed high heterogeneity (more than 50%). Different results are possible due to differences in questionnaire versions (e.g., UDI-6, UDI-short form) and different follow-up times [29-32].

Previous studies comparing yoga with pelvic floor muscle training (PFMT) have reported statistically significant effects. However, between-group analysis of the 1-hour pad test showed that yoga had no significant effect compared to PFMT. Yoga was significantly more effective in improving continence, but not on the urinary leakage parameter measured by the 1-hour pad test [30-32].

In summary, based on the results of a systematic review of yoga safety, only one study by Huang et al. [23] reported side effects in the pelvic yoga group (45 cases) and in the control group (47 cases) with musculoskeletal and connective tissue disorders, namely 16 cases in the pelvic yoga group and 18 cases in the control group. Furthermore, infectious diseases were more prevalent in the pelvic yoga group (7 cases) compared to the physical conditioning group (3 cases). This was generally mild and similar between the yoga and control groups, and there were no serious side effects that caused death, disability, or admission to hospital. Therefore, we suggest that yoga intervention is well tolerated and does not increase the risk of serious side effects on organ systems.

Previous studies have shown that the most common side effects originate from the musculoskeletal system and the respiratory or sinus systems. [21-22] Classification based on the Medical Dictionary for Regulatory Activities (MedDRA) indicates that musculoskeletal and connective tissue disorders are the most frequently reported side effects. This reinforces the evidence that yoga can be a safe complementary therapy for improving basic pelvic function and reducing urogenital distress without posing significant risks [21-23].

This systematic review and meta-analysis have several important limitations. First, the included studies generally had small sample sizes, which may have reduced statistical power to detect significant differences between intervention and control groups. Second, we observed substantial heterogeneity ($I^2 > 50\%$) across studies, indicating considerable variation in outcomes. This high heterogeneity likely reflects methodological differences in study designs, participant characteristics, or intervention protocols, making it challenging to draw definitive conclusions. Third, the use of inconsistent control groups across studies may have introduced bias and affected result comparability. Fourth, the variability in yoga techniques (e.g., Iyengar, Hatha, restorative) may have influenced outcomes, as different yoga styles could have distinct effects on urinary incontinence symptoms. Finally, the duration of yoga interventions varied significantly (ranging from 6 to 12 weeks), potentially impacting the magnitude of observed treatment effects.

Conclusion

Yoga effectively reduces the severity of urinary incontinence and enhances the quality of life for women affected by this condition; however, it does not significantly impact the frequency of urinary incontinence. Further research is necessary, utilizing larger sample sizes, multi-center approaches, and standard care comparators.

Conflict of Interest

The authors define no conflict of interest.

References

[1] Bethel K. Yoga for treating urinary incontinence in women: commentary on a Cochrane review. *Explore (NY)*. 2019 Jul;15(4):320–2. doi: 10.1002/14651858.CD012668.pub2.

[2] Russo E, Caretto M, Giannini A, Bitzer J, Cano A, Ceausu I, et al. Management of urinary incontinence in postmenopausal women: an EMAS clinical guide. *Maturitas*. 2021 Jan;143:223–30. doi: 10.1016/j.maturitas.2020.09.005.

[3] Sussman RD, Syan R, Brucker BM. Guideline of guidelines: urinary incontinence in women.

BJU Int. 2020 May;125(5):638–55. doi: 10.1111/bju.14927.

[4] Denisenko AA, Clark CB, D'Amico M, Murphy AM. Evaluation and management of female urinary incontinence. *Can J Urol*. 2021;28(Suppl 2):27–32.

[5] Kannan P, Hsu WH, Suen WT, Chan LM, Assor A, Ho CM. Yoga and Pilates compared to pelvic floor muscle training for urinary incontinence in elderly women: a randomised controlled pilot trial. *Complement Ther Clin Pract*. 2022 Feb;46:101502. doi: 10.1016/j.ctcp.2021.101502.

[6] Todhunter-Brown A, Hazelton C, Campbell P, Elders A, Hagen S, McClurg D. Conservative interventions for treating urinary incontinence in women: an overview of Cochrane systematic reviews. *Cochrane Database Syst Rev*. 2022 Sep;2022(9). doi: 10.1002/14651858.CD012337.pub2.

[7] Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021 Mar 29;n71. doi: 10.1136/bmj.n71.

[8] Page MJ, Moher D, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ*. 2021 Mar 29;n160. doi: 10.1136/bmj.n160.

[9] Harding CK, Lapitan MC, Arlandis S, Bø K, Costantini E, Groen J, et al. EAU guidelines on management of non-neurogenic female lower urinary tract symptoms (LUTS). Arnhem: EAU Guidelines Office; 2023.

[10] Minozzi S, Cinquini M, Gianola S, Gonzalez-Lorenzo M, Banzi R. The revised Cochrane risk of bias tool for randomized trials (RoB 2) showed low interrater reliability and challenges in its application. *J Clin Epidemiol*. 2020 Oct;126:37–44. doi: 10.1016/j.jclinepi.2020.06.015.

[11] Higgins JPT, Altman DG, Gotzsche PC, Juni P, Moher D, Oxman AD, et al. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ*. 2011 Oct 18;343:d5928. doi: 10.1136/bmj.d5928.

[12] Luo D, Wan X, Liu J, Tong T. Optimally estimating the sample mean from the sample size, median, mid-range, and/or mid-quartile range. *Stat Methods Med Res*. 2018 Jun;27(6):1785–805. doi: 10.1177/0962280216669183.

[13] Wan X, Wang W, Liu J, Tong T. Estimating the sample mean and standard deviation from the sample size, median, range and/or interquartile range. *BMC Med Res Methodol*. 2014 Dec;14(1):135. doi: 10.1186/1471-2288-14-135.

[14] Abbas A, Hefnawy MT, Negida A. Meta-analysis accelerator: a comprehensive tool for statistical data conversion in systematic reviews with meta-analysis. *BMC Med Res Methodol*. 2024 Oct 18;24(1):243. doi: 10.1186/s12874-024-02356-6.

[15] RStudio Team. RStudio: integrated development for R. Boston, MA: RStudio, PBC; 2020. Available from: http://www.rstudio.com/

[16] Kepes S, Wang W, Cortina JM. Heterogeneity in meta-analytic effect sizes: an assessment of the current state of the literature. *Organ Res Methods*. 2024 Jul;27(3):369–413. doi: 10.1177/10944281231169942.

[17] Oliveros H. Heterogeneity in meta-analyses: our greatest ally? *Colomb J Anesthesiol*. 2015 Jul;43(3):176–8.

[18] Borenstein M. How to understand and report heterogeneity in a meta-analysis: the difference between I-squared and prediction intervals. *Integr Med Res*. 2023 Dec;12(4):101014. doi: 10.1016/j.imr.2023.101014.

[19] Haddaway NR, Page MJ, Pritchard CC, McGuinness LA. PRISMA2020: an R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and open synthesis. *Campbell Syst Rev*. 2022 Jun;18(2):e1230. doi: 10.1002/cl2.1230.

[20] Shafaq S, Khan AA, Kazi M. Effects of Iyengar Yoga on Pelvic Floor Muscle Strength and Endurance among Young Females with Stress Urinary Incontinence. *PAFMJ*. 2022 Nov 10;72(5):1518–21. doi: 10.51253/pafmj.v72i5.7691.

[21] Huang AJ, Jenny HE, Chesney MA, Schembri M, Subak LL. A Group-Based Yoga Therapy Intervention for Urinary Incontinence in Women: A Pilot Randomized Trial. *Female Pelvic Med Reconstr Surg*. 2014 May;20(3):147–54. doi: 10.1097/SPV.0000000000000072.

[22] Huang AJ, Chesney M, Lisha N, Vittinghoff E, Schembri M, Pawlowsky S, et al. A group-based yoga program for urinary incontinence in ambulatory women: feasibility, tolerability, and change in incontinence frequency over 3 months in a single-center randomized trial. *Am J Obstet*

Gynecol. 2019 Jan;220(1):87.e1-87.e13. doi: 10.1016/j.ajog.2018.10.031.

[23] Huang AJ, Chesney M, Schembri M, Raghunathan H, Vittinghoff E, Mendes WB, et al. Efficacy of a Therapeutic Pelvic Yoga Program Versus a Physical Conditioning Program on Urinary Incontinence in Women: A Randomized Trial. *Ann Intern Med*. 2024 Oct;177(10):1339–49. doi: 10.7326/M23-3051.

[24] Batmani S, Jalali R, Mohammadi M, Bokaee S. Prevalence and factors related to urinary incontinence in older adult women worldwide: a comprehensive systematic review and meta-analysis of observational studies. *BMC Geriatr*. 2021 Dec;21(1):212. doi: 10.1186/s12877-021-02135-8.

[25] Tenfelde S, Janusek LW. Yoga: A Biobehavioral Approach to Reduce Symptom Distress in Women with Urge Urinary Incontinence. *J Altern Complement Med*. 2014 Oct;20(10):737–42. doi: 10.1089/acm.2013.0308.

[26] Tenfelde S, Tell D, Garfield L, Mathews H, Janusek L. Yoga for Women With Urgency Urinary Incontinence: A Pilot Study. *Female Pelvic Med Reconstr Surg*. 2021 Jan;27(1):57–62. doi: 10.1097/SPV.0000000000000723.

[27] Nicosia FM, Lisha NE, Chesney MA, Subak LL, Plaut TM, Huang A. Strategies for evaluating self-efficacy and observed success in the practice of yoga postures for therapeutic indications: methods from a yoga intervention for urinary incontinence among middle-aged and older women. *BMC Complement Med Ther*. 2020 Dec 14;20(1):148. doi: 10.1186/s12906-020-02934-3.

[28] Tunuguntla HSGR, Tunuguntla R, Kathuria H, Sidana A, Chaudhari N, Verma S, et al. App-Based Yoga of Immortals: A Novel, Easy-to-use Intervention in the Management of Urinary Incontinence. *Urology*. 2022 Sep;167:73–81. doi: 0.1016/j.urology.2022.06.011.

[29] Kim GS, Kim EG, Shin KY, Choo HJ, Kim MJ. Combined pelvic muscle exercise and yoga program for urinary incontinence in middle‐aged women. *Japan J Nurs Sci*. 2015 Oct 23;12(4):330–9. doi: 10.1111/jjns.12072.

[30] Sweta K, Godbole A, Awasthi HH, Pandey U. Mulabandha yoga therapy and its utility in cases of urinary incontinence in females: A randomized clinical trial. *Yoga Mimamsa*. 2020;52(1):12–9. doi: 10.4103/ym.ym_3_20.

[31] Vinchurkar SA, Arankalle DV. Integrating Yoga Therapy in the Management of Urinary Incontinence. *J Evid Based Complementary Altern Med*. 2015 Apr 24;20(2):154–6. doi: 10.1177/2156587214563311.

[32] Baker J, Costa D, Guarino JM, Nygaard I. Comparison of Mindfulness-Based Stress Reduction Versus Yoga on Urinary Urge Incontinence. *Female Pelvic Med Reconstr Surg*. 2014 May;20(3):141–6. doi: 10.1097/SPV.0000000000000061.