

Supplementary materials for:

Albarqouni L, Sanders S, Clark J, Tikkinen KA, Glasziou P. Self-management for men with lower urinary tract symptoms: a systematic review and meta-analysis. *Ann Fam Med*. 2021;19(2):157-167.

Supplemental Appendix. Search strategy used in this systematic review

PubMed search run 10/07/2019

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("Lower Urinary Tract Symptoms"[Mesh] OR "Prostatic Hyperplasia"[Mesh] OR "Urinary tract symptoms"[tiab] OR LUTS[tiab] OR Dysuria[tiab] OR Nocturia[tiab] OR Prostatism[tiab] OR "Overactive bladder"[tiab] OR "Underactive bladder"[tiab] OR "Urinary Incontinence"[tiab] OR "Urinary Stress"[tiab] OR "Urinary Urge"[tiab] OR "Painful Urination"[tiab] OR "Frequent Urination"[tiab] OR Nycturia[tiab] OR "Urge Incontinence"[tiab] OR "Prostatic Hypertrophy"[tiab] OR "Prostatic Hyperplasia"[tiab] OR "Prostatic Adenomas"[tiab] OR "Prostatic Adenoma"[tiab])
AND
(
"Self Care"[Mesh] OR "Behavior Therapy"[Mesh] OR "Life Style"[Mesh] OR "Self care"[tiab] OR "Self management"[tiab] OR Self-management[tiab] OR SMP[tiab] OR Behavioral[tiab] OR Behavioural[tiab] OR "Education"[tiab] OR "Fluid management"[tiab] OR "Bladder retraining"[tiab] OR "Bladder re-training"[tiab] OR "Toileting"[tiab] OR "Toilet training"[tiab] OR "Fluid input"[tiab] OR "Fluid manipulation"[tiab] OR Lifestyle[ti] OR "Life style"[ti] OR Lifestyles[ti] OR "Life styles"[ti] OR ((Avoid[tiab] OR Avoiding[tiab]) AND (Constipation[tiab])) OR (("Fluid intake"[tiab]) AND (Increase[tiab] OR Increasing[tiab] OR Decrease[tiab] OR Decreasing[tiab] OR Modify[tiab] OR Modifying[tiab])) OR (("Pelvic floor"[tiab]) AND (training[tiab] OR exercise[tiab] OR exercises[tiab]))
)
AND
(Randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR randomised[tiab] OR placebo[tiab] OR "drug therapy"[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab])
NOT
(Animals[Mesh] not (Animals[Mesh] and Humans[Mesh]))
NOT
(Female[Mesh] not (female[Mesh] and male[Mesh]))
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AND
(
[mh "Self Care"] OR [mh "Behavior Therapy"] OR [mh "Life Style"] OR "Self care":ti,ab OR "Self management":ti,ab OR Self-management:ti,ab OR SMP:ti,ab OR Behavioral:ti,ab OR Behavioural:ti,ab OR Education:ti,ab OR "Fluid management":ti,ab OR "Bladder retraining":ti,ab OR "Bladder re-training":ti,ab OR Toileting:ti,ab OR "Toilet training":ti,ab OR "Fluid input":ti,ab OR "Fluid
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manipulation":ti,ab OR Lifestyle:ti OR "Life style":ti OR Lifestyles:ti OR "Life styles":ti OR ((Avoid:ti,ab OR Avoiding:ti,ab) AND (Constipation:ti,ab)) OR (("Fluid intake":ti,ab) AND (Increase:ti,ab OR Increasing:ti,ab OR Decrease:ti,ab OR Decreasing:ti,ab OR Modify:ti,ab OR Modifying:ti,ab)) OR (("Pelvic floor":ti,ab) AND (training:ti,ab OR exercise:ti,ab OR exercises:ti,ab))
)
NOT
([mh Female] NOT ([mh female] AND [mh male]))

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('Lower Urinary Tract Symptom'/exp/mj OR 'prostate hypertrophy'/exp/mj OR "Urinary tract symptoms":ti,ab OR LUTS:ti,ab OR Dysuria:ti,ab OR Nocturia:ti,ab OR Prostatism:ti,ab OR "Overactive bladder":ti,ab OR "Underactive bladder":ti,ab OR "Urinary Incontinence":ti,ab OR "Urinary Stress":ti,ab OR "Urinary Urge":ti,ab OR "Painful Urination":ti,ab OR "Frequent Urination":ti,ab OR Nycturia:ti,ab OR "Urge Incontinence":ti,ab OR "Prostatic Hypertrophy":ti,ab OR "Prostatic Hyperplasia":ti,ab OR "Prostatic Adenomas":ti,ab OR "Prostatic Adenoma":ti,ab)
AND
(
'Self Care'/exp/mj OR 'Behavior Therapy'/exp/mj OR 'Lifestyle'/exp/mj OR "Self care":ti,ab OR "Self management":ti,ab OR Self-management:ti,ab OR SMP:ti,ab OR Behavioral:ti,ab OR Behavioural:ti,ab OR Education:ti,ab OR "Fluid management":ti,ab OR "Bladder retraining":ti,ab OR "Bladder re-training":ti,ab OR Toileting:ti,ab OR "Toilet training":ti,ab OR "Fluid input":ti,ab OR "Fluid manipulation":ti,ab OR Lifestyle:ti OR "Life style":ti OR Lifestyles:ti OR "Life styles":ti OR ((Avoid:ti,ab OR Avoiding:ti,ab) AND (Constipation:ti,ab)) OR (("Fluid intake":ti,ab) AND (Increase:ti,ab OR Increasing:ti,ab OR Decrease:ti,ab OR Decreasing:ti,ab OR Modify:ti,ab OR Modifying:ti,ab)) OR (("Pelvic floor":ti,ab) AND (training:ti,ab OR exercise:ti,ab OR exercises:ti,ab))
)
AND
(random* OR factorial OR crossover OR placebo OR blind OR blinded OR assign OR assigned OR allocate OR allocated OR 'crossover procedure'/exp OR 'double-blind procedure'/exp OR 'randomized controlled trial'/exp OR 'single-blind procedure'/exp NOT ('animal'/exp NOT ('animal'/exp AND 'human'/exp)))
NOT
('Female'/exp NOT ('female'/exp AND 'male'/exp))
AND
[embase]/lim

Supplemental Tables

Supplemental Table 1. Details of the 13 studies (18 articles) that are included in the review but did not provide usable outcome data*.

Author Year	Title; Journal	Reason	Comparison
1	Bryant 2002 Caffeine reduction education to improve urinary symptoms; <i>Br J Nurs</i>	No subgroup analysis for men	Single component
2	Chancellor 2008 A comparison of the efficacy of darifenacin alone vs. darifenacin plus a Behavioural Modification Programme upon the symptoms of overactive bladder; <i>Int J Clin Pract</i>	No subgroup analysis for men	SM + drug vs. drug
3	Chen 2008 Does pelvic floor muscle exercises adding on effects on overactive bladder patients with unsatisfactory drug responses? (Abstract number 183); <i>Proceedings of the 38th annual meeting of the international continence society (ICS)</i>	Abstract only and no subgroup analysis for men	SM + drug vs. drug
4	Cho 2014 Effect of combined systematized behavioral modification education program with desmopressin in patients with nocturia: a prospective, multicenter, randomized, and parallel study; <i>Int Neurourol J</i>	No subgroup analysis for men	SM + drug vs drug
	Cho 2015 The effect of combined systematized behavioral modification education program (SBMP) with DDAVP in patients with nocturia: a multicenter, randomized, and parallel study; <i>European Urology, Supplements</i> .		
	Cho 2015 The effect of combined systematized behavioral modification education program (SBMP) with DDAVP in patients with nocturia: A prospective, multicenter, randomized, and parallel study; <i>Journal of Urology</i>		
5	Duong 2019 Community pharmacist intervention for lower urinary tract symptoms: a pilot study; <i>J Am Geriatr Soc</i>	Abstract only and no subgroup analysis for men	SM vs control/usual
	Sadowski 2017 Feasibility of a community pharmacist intervention for lower urinary tract symptoms; <i>Canadian Pharmacists Journal</i>		
6	Herschorn 2004 Impact of a health education intervention in overactive bladder patients; <i>Can J Urol</i>	No subgroup analysis for men	SM + drug vs. drug
	Herschorn 2003 The impact of a simple health education intervention in overactive bladder patients (Abstract); <i>Proceedings of the 33rd annual meeting of the international continence society (ICS)</i>		SM + drug vs. drug

7	Kilinc 2019	Using a checklist to increase the effectiveness of behavioral therapy for overactive bladder: A prospective randomized controlled trial; <i>Neurourol Urodyn</i>	No subgroup analysis for men	SM + drug vs drug
8	Kobayashi 2009	Researches on the improvement of QOL in both patients with overactive bladder syndrome and their caregivers. Comparison between pharmacotherapy alone and combination of pharmacotherapy, physiotherapy, and education of both patients and caregiver (Abstract number 516); <i>Proceedings of the 39th annual meeting of the international continence society (ICS)</i>	Abstract only and no subgroup analysis for men	SM + drug vs drug
9	Mattiasson 2003	Simplified bladder training augments the effectiveness of tolterodine in patients with an overactive bladder; <i>BJU Int</i>	No subgroup analysis for men	SM + drug vs drug
10	Mattiasson 2010	Efficacy of simplified bladder training in patients with overactive bladder receiving a solifenacin flexible-dose regimen: results from a randomized study; <i>BJU Int</i>	No subgroup analysis for men	SM + drug vs drug
	Mattiasson 2008	Solifenacin alone and with simplified bladder re-training in overactive bladder syndrome: the prospective, randomised SOLAR study (Abstract number 179); <i>Proceedings of the 38th annual meeting of the international continence society (ICS)</i>		SM + drug vs drug
11	Millard 2004	Clinical efficacy of tolterodine with or without a simplified pelvic floor exercise regimen; <i>Neurourol Urodyn</i>	No subgroup analysis for men	SM + drug vs drug
12	Palmer 2015	A Feasibility Study for a Posthospital Intervention for Lower Urinary Tract Symptoms in Adults With Heart Failure; <i>J Wound Ostomy Continence Nurs</i>	No subgroup analysis for men	SM vs control/usual
13	Weng 2010	The effects of pelvic floor muscle exercise for irritable symptoms in older men with LUTS suggestive of BPH; <i>International Journal of Urology</i>	Abstract only	SM vs control/usual

Abbreviations: SM: Self-Management. *The majority of these studies did not report a separate analysis of the effect of interventions for men only.

Supplemental Table 2. Details of the 67 articles screened in full text but excluded from the review with reason for their ineligibility

Author, Year	Title	Journal	Reason for exclusion
2003	Behavioural training for urge incontinence	Geriatrics & Aging	Study design
2010	34th Congresso Nazionale SIUD, 8th Congresso SIUD - Fisioterapisti Infermieri Ostetriche	Neurourol Urodyn	No abstract relevant
2011	36th Annual IUGA Meeting	International Urogynecology Journal and pelvic floor dysfunction	Population not relevant
2012	Proceedings of the 11th Annual Meeting of the International Society for the Study of Women's Sexual Health, ISSWSH 2012	Journal of Sexual Medicine	Population not relevant
2013	43rd Annual Meeting of the International Continence Society, ICS 2013	Neurourol Urodyn	No abstract relevant
2016	Abstracts of the Intensive Care Annual Scientific Meeting of the Australian and New Zealand Intensive Care Society, ANZICS and Australian College of Critical Care Nurses, ACCCN 2015	Anaesthesia and Intensive Care	No abstract relevant
2018	42nd Annual Congress of the Italian Urodynamic Society	Neurourol Urodyn	No abstract relevant
Albertsen 2005	Single-blind, randomized trial of pelvic floor muscle training, biofeedback-assisted pelvic floor muscle training, and electrical stimulation in the management of overactive bladder	J Urol	Population not relevant
Azizi 2019	The effect of a self-care programme on urinary incontinence and self-esteem in elderly men dwelling in nursing homes in Iran.	The Aging Male	Population not relevant
Bo 2003	Pelvic floor muscle strength and response to pelvic floor muscle training for stress urinary incontinence	Neurourol Urodyn	Population not relevant
Bo 2005	Lower urinary tract symptoms 15 years after ending a randomised controlled trial of pelvic floor muscle training for urodynamic stress incontinence (Abstract number 355)	European Urology, supplements	Population not relevant
Bonakdar Tehrani 2013	Treating urge incontinence in older adults: A quality adjusted life-year(QALY) bargain	Value in Health	Study design

Borrie 2002	Interventions led by nurse continence advisers in the management of urinary incontinence: a randomized controlled trial	CMAJ	Intervention not relevant
Breyer 2014	Intensive lifestyle intervention reduces urinary incontinence in overweight/obese men with type 2 diabetes: results from the Look AHEAD trial	J Urol	Intervention not relevant
Burgio 1994	The effects of changing prompted voiding schedules in the treatment of incontinence in nursing home residents	J Am Geriatr Soc	Study design
Burns 1990	Treatment of stress incontinence with pelvic floor exercises and biofeedback	J Am Geriatr Soc	Population not relevant
Burton 1988	Behavioral training for urinary incontinence in elderly ambulatory patients	J Am Geriatr Soc	Intervention not relevant
Carrión Pérez 2015	Telerehabilitation to treat stress urinary incontinence. Pilot study	Medicina clinica	Population not relevant
Celiker Tosun 2013	Are symptoms of urinary incontinence reduced in patients when the muscles of the pelvic floor are strengthened through pelvic floor muscle (PFM) training? What is the relationship between symptoms and strength? (Abstract number 409)	Proceedings of the 43rd annual meeting of the international continence society (ics), 2013 aug 26-30, barcelona, spain	Population not relevant
Celiker Tosun 2013	Determining the effects of pelvic floor exercises in urinary incontinence treatment on pelvic floor muscle strength by non-invasive method, randomized trial (Abstract number 582)	Proceedings of the 43rd annual meeting of the international continence society (ics), 2013 aug 26-30, barcelona, spain	Population not relevant
Celiker Tosun 2015	Does pelvic floor muscle training abolish symptoms of urinary incontinence? A randomized controlled trial	Clinical rehabilitation	Population not relevant
Cho 2008	A Comparative Study on the Effects on Urinary Incontinence between Pelvic Floor Muscle Exercise and Magnetic Stimulation Therapy	J Korean Acad Community Health Nurs	Intervention not relevant
Choi 2016	A participatory action research to evaluate the outcomes of care of a nurse-led continence care service for Chinese primary care patients with lower urinary tract symptoms: a two-year prospective longitudinal study	Neurourol Urodyn	Study design
Colling 1992	The effects of patterned urge-response toileting (PURT) on urinary incontinence among nursing home residents	J Am Geriatr Soc	Intervention not relevant

Dorey 2004	Pelvic floor exercises for treating post-micturition dribble in men with erectile dysfunction: a randomized controlled trial	Urol Nurs	Intervention not relevant
Dumoulin 2004	Efficacy of deep abdominal training when combined with pelvic floor muscle training for stress urinary incontinence: a single-blind randomized controlled trial (Abstract number 44)	Progres en urologie	Full text not available
Elgohary 2017	Pulsed electromagnetic field with or without exercise therapy in the treatment of benign prostatic hyperplasia	J Phys Ther Sci	Intervention not relevant
Eli 2008	Efficacy and safety of duloxetine compared with placebo, pelvic floor muscle training, and combined duloxetine/pelvic floor muscle training in subjects with moderate to severe stress urinary incontinence. CT Registry ID#2615. Study F1J-MC-SBAF	Eli Lilly clinical trial registry [accessed 4 June 2008]	Population not relevant
Ervin 2018	Reducing nocturia in community dwelling older people with cardiovascular disease: A prospective study to measure the effects of active leg elevation	Neurourol Urodyn	Study design
Fitzgerald 2008	Nocturia, nocturnal incontinence prevalence, and response to anticholinergic and behavioral therapy	International urogynecology journal and pelvic floor dysfunction	Population not relevant
Fonda 1995	Sustained improvement of subjective quality of life in older community-dwelling people after treatment of urinary incontinence	Age and Ageing	Comparator not relevant
Griebling 2014	Re: Efficacy of adding behavioural treatment or antimuscarinic drug therapy to α -blocker therapy in men with nocturia: Editorial comment	Journal of Urology	Study design
Griebling 2014	Re: internet-based treatment of stress urinary incontinence: a randomised controlled study with focus on pelvic floor muscle training	Journal of Urology	Study design
Hashim 2008	How should patients with an overactive bladder manipulate their fluid intake?	BJU Int	Intervention not relevant
Herbison 2004	Three month results from the URGENT pilot study: a randomised controlled trial comparing drug therapy, bladder retraining and their combination in patients with urge urinary incontinence (Abstract)	Proceedings of the joint meeting of the international continence society (ICS) (34th annual meeting) and the international urogynecological association (IUGA), 2004 Aug 23-27, Paris, France	Population not relevant
Hu 1988	A clinical trial of a behavioral therapy to reduce urinary incontinence in nursing homes	Neurourol Urodyn	Population not relevant

Hu 1988	A clinical trial of a behavioural therapy to reduce urinary incontinence in nursing homes (Abstract)	Neurourol Urodyn	Population not relevant
Hu 1990	Cost effectiveness of training incontinent elderly in nursing homes: a randomized clinical trial	Health services research	Population not relevant
Johnson 2000	Biofeedback versus verbal instruction for pelvic floor training in the treatment of urinary incontinence	Journal of women's health physical therapy	Population not relevant
Johnson 2013	Efficacy of adding behavioural treatment or antimuscarinic drug therapy to alpha-blocker therapy in men with nocturia	BJU Int	Population not relevant/ reporting of subgroup analysis of another included study
Kafri 2013	Randomized trial of a comparison of rehabilitation or drug therapy for urgency urinary incontinence: 1-year follow-up	International Urogynecology Journal	Intervention not relevant
Lee 2014	Development and evaluation of an E-health system to care for patients with bladder pain syndrome/interstitial cystitis	Int J Urol	Population not relevant
Lee 2018	Effectiveness and safety of moxibustion for alleviating symptoms of overactive bladder: A prospective, randomized controlled, crossover-design, pilot study	Medicine (Baltimore)	Intervention not relevant
Linn 1994	Geriatrics. Behavioral treatment of urinary incontinence (Abstract)	Rehab: R&D progress reports	Full text not available
Linn 1996	Geriatrics: behavioral treatment of urinary incontinence	Rehab: R&D progress reports	Intervention not relevant
Markun 2014	Stress incontinence: first pelvic floor training or direct surgery?	Praxis	Study design
McDowell 1999	Effectiveness of behavioral therapy to treat incontinence in homebound older adults	J Am Geriatr Soc	Intervention not relevant
O'Brien 1991	Urinary incontinence: prevalence, need for treatment, and effectiveness of intervention by nurse	BMJ	Intervention not relevant
Ponieman 2007	Self management plus usual care was more effective than usual care alone for lower urinary tract symptoms in men: Commentary	Evidence-Based Medicine	Study design

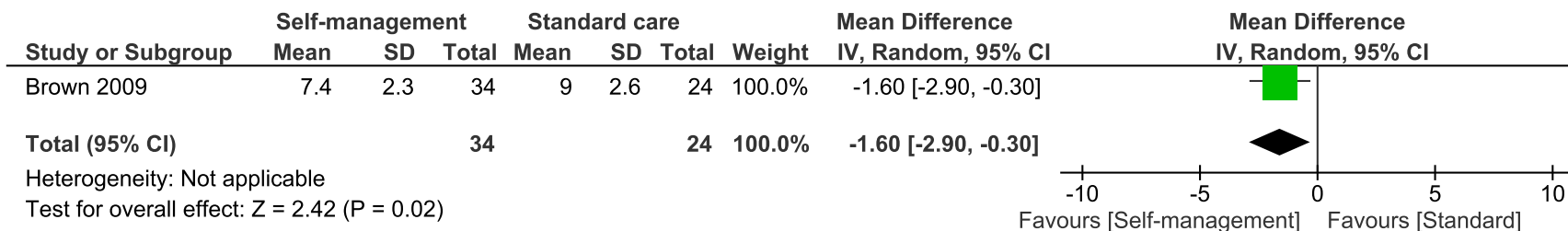
Reisenauer 2008	The effectiveness of pelvic floor exercise in patients with stress- urinary incontinence three-armed prospective randomized comparison study (Abstract)	Geburtshilfe und frauenheilkunde	Population not relevant
Roehrborn 2015	Efficacy and safety of a fixed-dose combination of dutasteride and tamsulosin treatment (Duodart((R))) compared with watchful waiting with initiation of tamsulosin therapy if symptoms do not improve, both provided with lifestyle advice, in the management of treatment-naive men with moderately symptomatic benign prostatic hyperplasia: 2-year CONDUCT study results	BJU Int	Intervention not relevant
Schnelle 2010	A controlled trial of an intervention to improve urinary and fecal incontinence and constipation	J Am Geriatr Soc	Intervention not relevant
Sung 2015	Interventions do not enhance medication persistence and compliance in patients with overactive bladder: a 24 weeks, randomised, open-label, multi-center trial	International journal of clinical practice	population not relevant
Szonyi 1995	Oxybutynin with bladder retraining for detrusor instability in elderly people: a randomized controlled trial	Age Ageing	Intervention not relevant
Teo 2008	Detrusitol (trademark) and multicomponent behavioral training for overactive bladder syndrome: are they synergistic? (Abstract number 191)	Proceedings of the 38th annual meeting of the international continence society (ICS), 2008 oct 20-24, cairo, egypt	Population not relevant
Viereck 2011	Comparison of solifenacin combined with pelvic floor muscle and whole body vibration training with solifenacin alone in patients with overactive bladder syndrome - a prospective randomized parallel group trial (Trials registry number: nCT01314781)	Clinicaltrials.gov (http://clinicaltrials.gov)	Population not relevant
White 2002	Treatment of nocturia with head tilt a randomised control trial		Full text not available
Williams 2005	Clinical and cost-effectiveness of a new nurse-led continence service: a randomised controlled trial	Br J Gen Pract	Intervention not relevant
Wolters 2006	Improving initial management of lower urinary tract symptoms in primary care: costs and patient outcomes	Scand J Urol Nephrol	Study design
Wong 1997	Randomized prospective study of the effectiveness of pelvic floor training using biofeedback in the treatment of genuine stress urinary incontinence in Chinese population	Proceedings of the international continence society (ICS), 27th annual meeting, 1997 sep 23-26, yokohama, japan	Full text not available

Xie 2005	Effects of psychological interventions on emotion and quality of life of elderly patients with benign prostatic hypertrophy	Chinese journal of clinical rehabilitation	Comparator not relevant
Xu 2018	Effects of an education program on toileting behaviors and bladder symptoms in overactive bladder patients with type 2 diabetes: A randomized clinical trial	Int J Nurs Stud	Intervention not relevant
Yoshimura 2014	A multicenter randomized controlled trial of life style measures alone, versus life style measures plus ramelteon, for nocturia: an interim analysis	Neurourol Urodyn	Intervention not relevant
Zhang 2016	From a patient perspective: Is a behavioral intervention to urinary incontinence worthy of trying?	Psycho-Oncology	population not relevant
Zhao 2000	Microwave combined with pelvic floor muscle exercise treatment for the middle and elderly patients with urinary incontinence	Chinese journal of physical therapy	Comparator not relevant
Zhu 2006	A prospective control study on treatment of stress urinary incontinence with alpha-adrenoceptor agonists and pelvic floor muscle exercises	Zhonghua fu chan ke za zhi	population not relevant

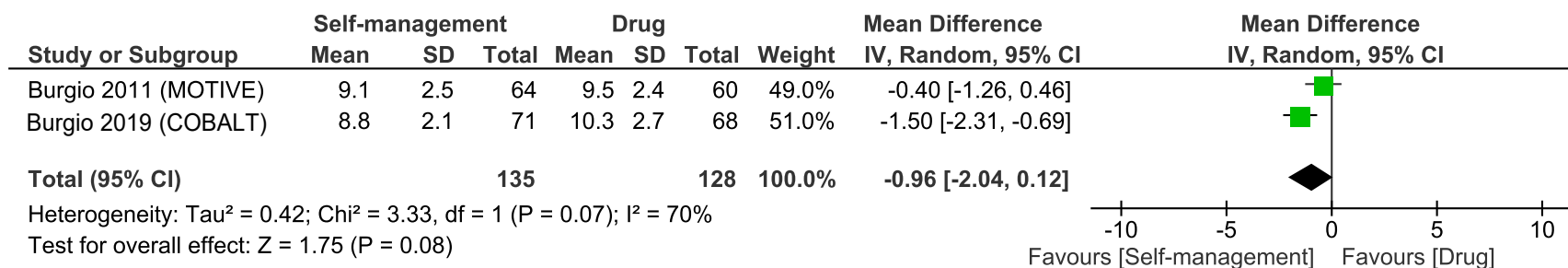
Supplemental Figures

Supplemental Figures 1A, 1B, and 1C

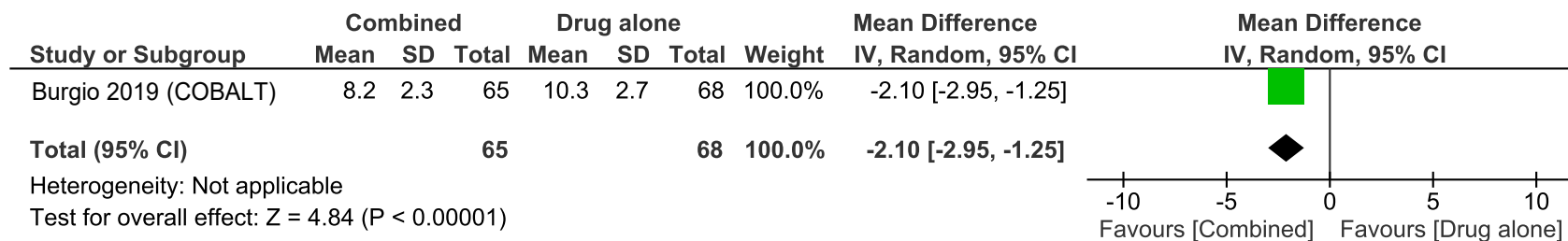
A Self-management intervention versus usual care, 24-hour voiding frequency at 12 months



B Self-management intervention versus drug intervention, 24-hour voiding frequency at 6-12 weeks

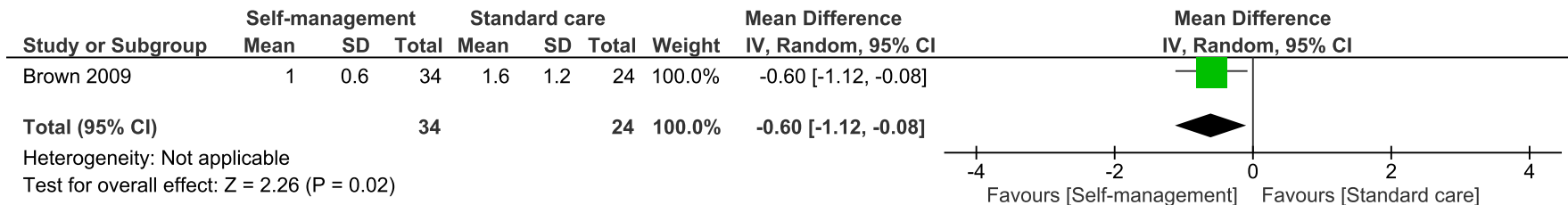


C Combined self-management intervention and drug interventions versus drug intervention alone, 24-hour voiding frequency at 6 weeks

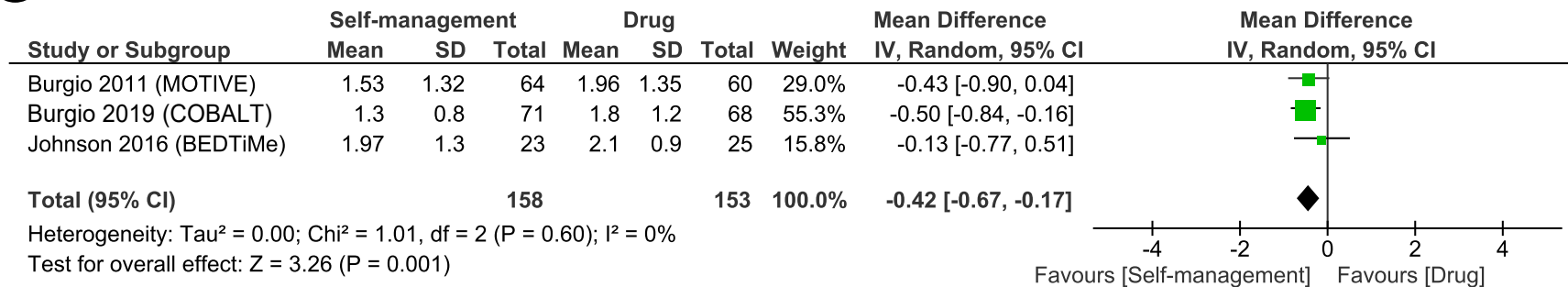


Supplemental Figures 2A, 2B, and 2C

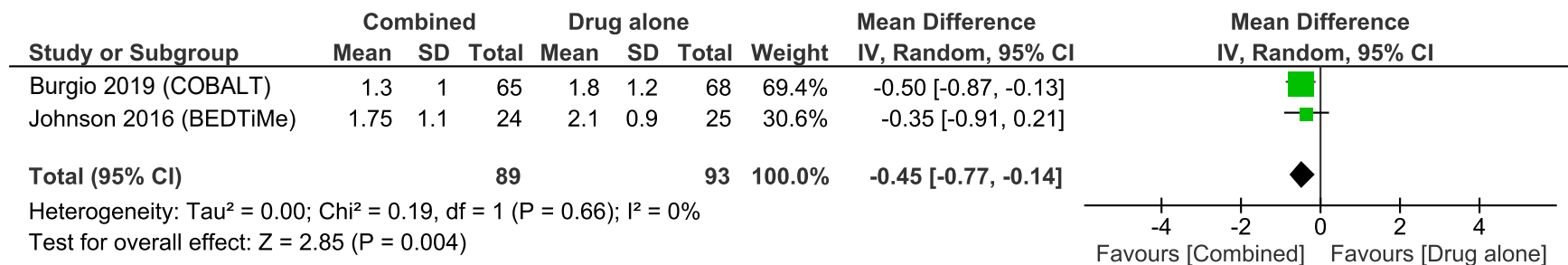
A Self-management intervention versus usual care, nocturia episodes at 12 months



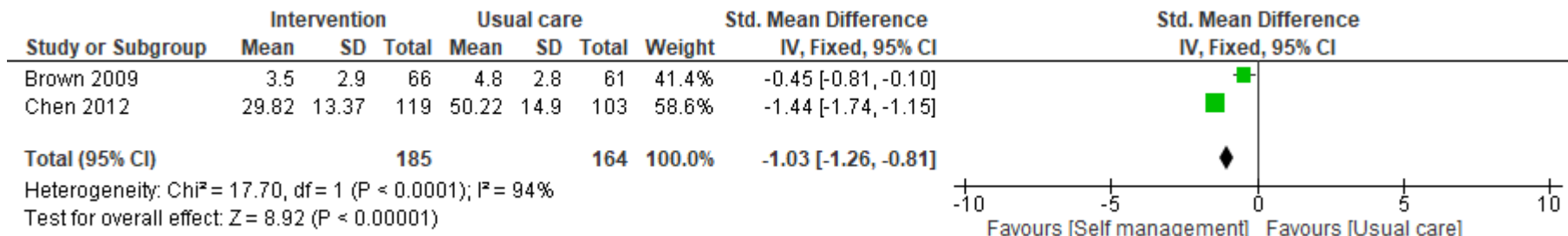
B Self-management intervention versus drug intervention, nocturia episodes at 6-12 weeks



C Combined self-management intervention and drug interventions versus drug intervention alone, nocturia episodes at 6-12 weeks



Supplemental Figure 3. Forest plot of symptoms impact score (BPH Impact Index, BPH-QoL score) in self-management intervention group versus usual/standard care at 6 months



Supplemental Figure 4. Forest plot of 'How bothersome were side effects?' (i.e. any side effects compared to no side effects) in self-management intervention group versus drug intervention at 6-8 weeks.

