

The Effect of Pelvic Floor Biofeedback Training for Urinary Incontinence in Patients with Prostate Cancer after Radical Prostatectomy: A Meta-Analysis of Randomized Controlled Trials

Lan-Fang Hsu ^a and Pei-Shan Tsai ^{a,b,c,*}

^a Graduate Institute of Nursing, College of Nursing, Taipei Medical University, Taipei, Taiwan ^b Department of Nursing, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan ^c Sleep Science Center, Taipei Medical University Hospital, Taipei, Taiwan

Introduction :

Urinary incontinence (UI), a common complication of radical prostatectomy, can decrease the quality of life of prostate cancer patients

Objective:

To evaluated the additional effect of pelvic floor biofeedback training (PFBT) in prostate cancer patients with UI.

(a) PFBT vs. PFMT, $I^2 = 26.69\%$ Model Study name Hedges's g and 95% CI Weight (Fixed) Statistics for each study Relative Relative Relative Relative 17.56 16.9721.62 22.95 Wille, et al., 2003 1.167 0.243 29.2225.17-0.434 0.664 -0.496 0.316 14.29 -1.325 0.185 12.89-1.025 0.198 9.63 7.93 Franke, et al., 2000 -0.715 0.475 0.495 11.72 -1.767 0.077 10.04 Tienforti, et al. 0.068 Fixed Random 0.018 -0.359 0.167 -0.714 0.475 -0.096

(b-1) High quality, $I^2 = 0.00\%$

•*Criteria*:

Method :

- Patient: Prostate cancer patients, who had received prostatectomy.
- Intervention: PFBT with or without electrical stimulation on UI \checkmark
- Comparison: Pelvic floor muscle training (PFMT) with or without \checkmark electrical stimulation
- Outcome: Self-reported UI immediate post-training, at the 3rd month \checkmark (intermediate-term) after training, and at the 6th month (long-term) after training.
- ✓ Study design: Randomized controlled trials (RCTs) •Search strategy:
 - ✓ A systematic search of CINAHL, Cochrane Library, BioMed, Pubmed/Medline, and Web of science.
- •*Methodological quality assessment*:
 - \checkmark The Cochrane Collaboration's tool.
- •Data extraction and management:
 - ✓ According to recommendations from the Cochrane Handbook for Systematic Review of Intervention 5.1.0.

•Statistical analysis:

Result:

✓ The Comprehensive Meta Analysis software 2.0.

Relative Relative Relative Relative 0.316 -0.434 56.03 -1.025 0.198 -1.325 0.185 24.7124.71Ahmed et al. 2011 19.26 19.26 0.125 -1.317 0.068 -1.767 0.077 Tienforti et al 0.024 -0.577 0.031 -1.759 0.079 Fixed 0.024 -0.577 0.031 -1.759 0.079 Random (b-2) Low quality, $I^2 = 0.00\%$ 0.074 -0.376 0.690 0.579 0.563 35.46 35.46 Bales, et al., 2000 0.055 -0.185 0.731 1.167 0.243 47.96 47.96 Wille, et al., 2003 16.57 16.57 0.158 -1.064 0.495 -0.715 0.475 Franke, et al., 2000 0.026 -0.178 0.457 0.862 Fixed. 0.026 -0.178 0.457 0.862 0.389 Random -1.00 0.00 1.00 2.00 Favours PFBT Favours PFMT

Fig. 2 Forest plots of *immediate post-training effects* of pelvic floor biofeedback training (PFBT) on selfreported urinary incontinence following radical prostatectomy compared with pelvic floor muscle training (PFMT).

(a) PFBT vs. PFMT, $I^2 = 66.72\%$

del <u>Study name</u>	Statistics for each study							Hedges's g and 95% CI			Weight	(Fixed)	
	Hedges's g		Variance	Lower limit		Z-Value I	-Value						Relative weight
Bales, et al., 2000	0.104	0.227	0.051	-0.341	0.548	0.457	0.648				38.39)	24.56
Burgio, et al., 2006_a	-0.706	0.338	0.114	-1.368	-0.044	-2.089	0.037	┝╶┼╋			17.30)	19.80
Ahmed, et al., 2011	0.334	0.331	0.110	-0.316	0.983	1.007	0.314			-	17.97	,	20.07
Tienforti, et al., 2012_a	-1.044	0.369	0.136	-1.766	-0.322	-2.833	0.005	│	-		14.54	Ļ	18.56
Franke, et al., 2000_a	-0.364	0.409	0.167	-1.165	0.438	-0.889	0.374				11.81	l	17.01

•Descriptive analysis:

✓ 6 RCTs involving 411 prostate cancer patients with UI (Fig.1). •*The Effects of PFBT:*

- Overall, the post-treatment, intermediate-term (3rd month), and long- \checkmark term (6th month) effects of PFBT on self-reported UI were not statistically significant (P = 0.475, P = 0.231 and 0.193, respectively) compared with PFMT. (Fig. 2a, Fig 3a, Fig 4a)
- High quality studies had larger and significant long-term effect (mean \checkmark effect size, -0.76; 95% CI, -1.27 to -0.25) on self-reported UI in comparison with those of poor quality studies. (Fig. 2b, Fig. 3b, Fig. 4b)
- The treatment dosage (total exercise minutes) was significantly \checkmark associated with the long-term effect size (P = 0.026), but not the immediate (p = 0.079) or intermediate-term effect (p = 0.065)
- No heterogeneity or publication. \checkmark

Conclusion:

- ✓ PFBT did not yield a significant additional effect on improving UI in prostate cancer patients in comparison with PFMT.
- Additional high quality studies for further investigating the efficacy of \checkmark PFBT on decreasing the severity of UI are needed.

Records identified through PubMed:



(b-1) High quality, $I^2 = 77.15\%$

Burgio, et al., 2006_a	-0.706	0.338	0.114 -1.368 -0.044	-2.089	0.037	│ ┽┳╌┤ │	34.73	33.69
Ahmed, et al., 2011	0.334	0.331	0.110 -0.316 0.983	1.007	0.314	┤ │ ┽╋╌┤	36.08	33.97
Tienforti, et al., 2012_a	-1.044	0.369	0.136 -1.766 -0.322	-2.833	0.005	│──奪──│ │	29.19	32.34
Fixed	-0.429	0.199	0.040 -0.820 -0.039	-2.157	0.031			
Random	-0.462	0.417	0.174 -1.280 0.356	-1.107	0.268			

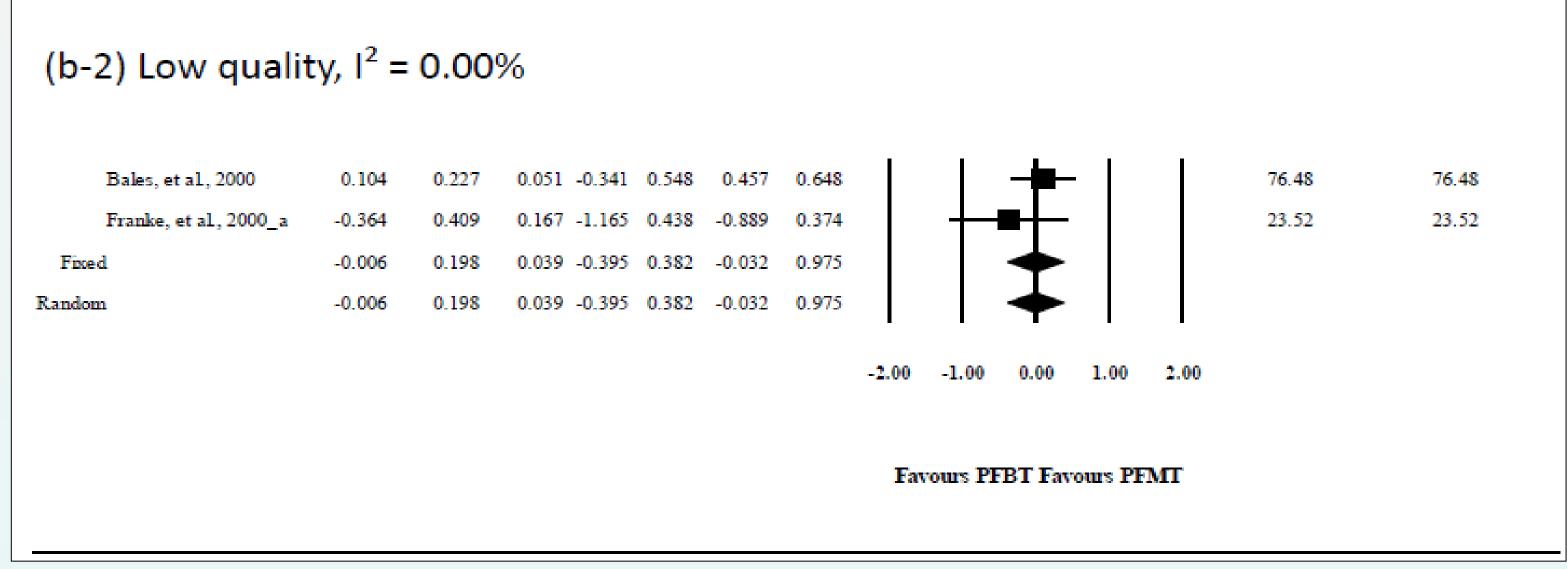
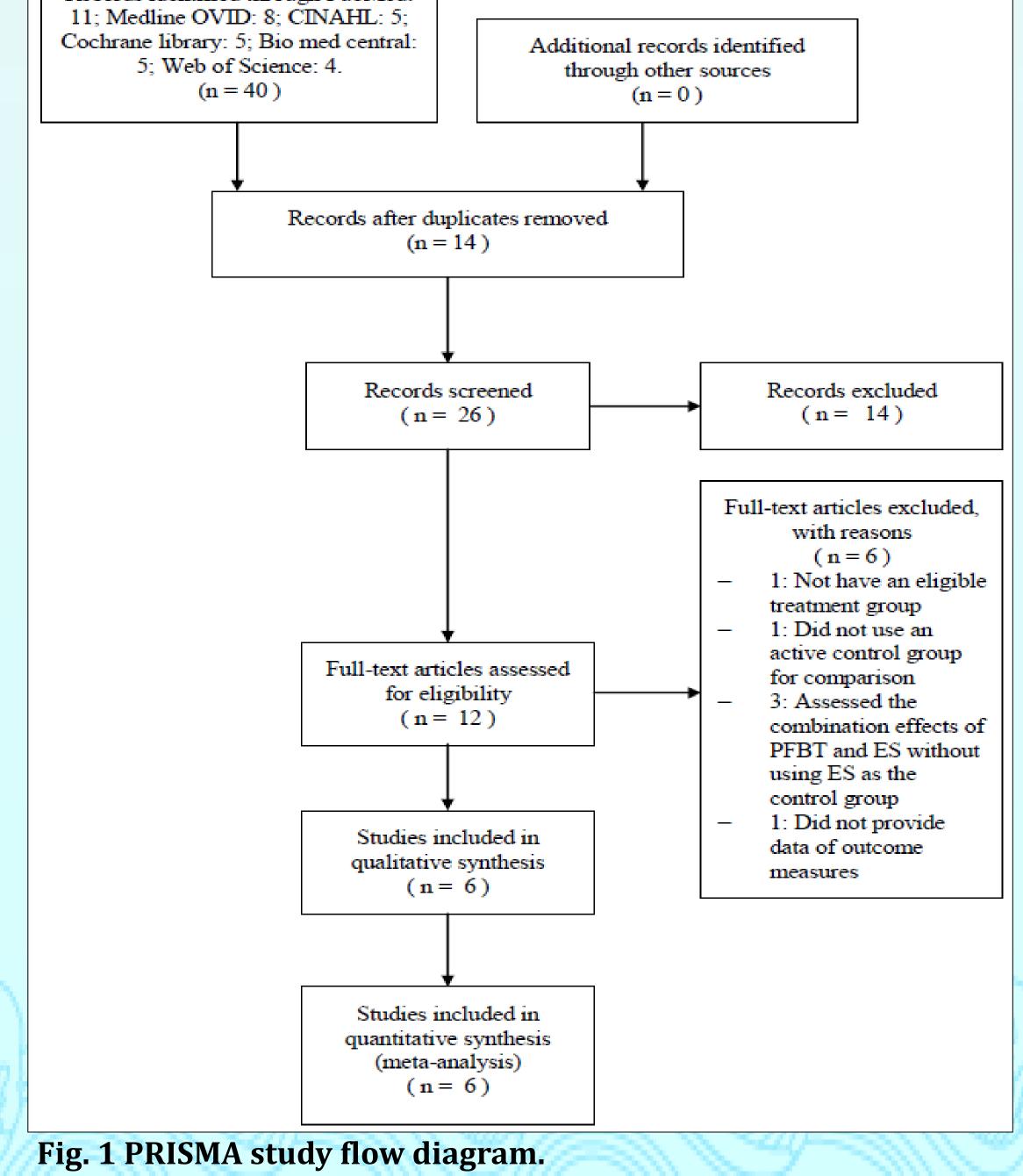
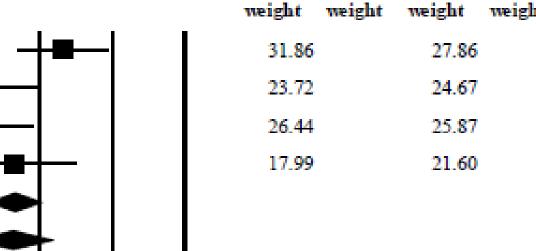


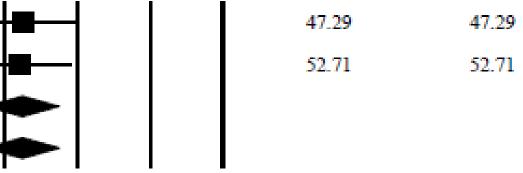
Figure. 3 Forest plots of *the intermediate-term (3rd month) effects* of pelvic floor biofeedback training (PFBT) on self-reported urinary incontinence following radical prostatectomy compared with pelvic floor muscle training (PFMT).

(a) PFBT vs. PFM	T, I ² = 56.21%		
Model Study name	Statistics for each study	Hedges's g and 95% CI	Weight (Fixed)
	Hedges's Standard Lower Upper		Relative Relative Relative Relative



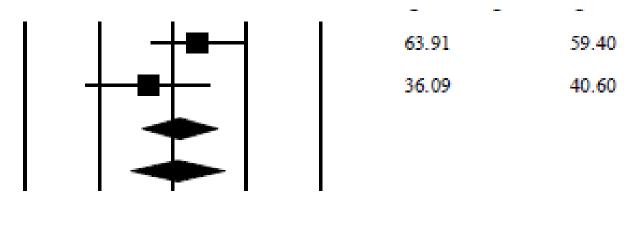


Burgio, et al., 2006_b	-0.740	0.378	0.143 -1.481 0.002	-1.955	0.051	│ ╶┼ ╋──┤
Tienforti, et al., 2012_b	-0.785	0.358	0.128 -1.488 -0.083	-2.191	0.028	₩
Fixed	-0.764	0.260	0.068 -1.274 -0.254	- 2.93 5	0.003	-
Random	-0.764	0.260	0.068 -1.274 -0.254	-2.935	0.003	



(b-2) Low quality, $I^2 = 32.43\%$

Wille, et al., 2003	0.328	0.326	0.107 -0.311	0.968	1.006	0.315
Franke, et al., 2000_b	-0.333	0.434	0.189 -1.184	0.519	-0.766	0.444
Fixed	0.090	0.261	0.068 -0.422	0.601	0.344	0.731
Random	0.060	0.325	0.105 -0.576	0.696	0.185	0.854



-2.00 -1.00 0.00 1.00 2.00

Favours PFBT Favours PFMT

Fig. 4 Forest plots of the long-term effects of pelvic floor biofeedback training (PFBT) on self-reported urinary incontinence following radical prostatectomy compared with pelvic floor muscle training (PFMT).