

Pelvic floor muscle training protocol for stress urinary incontinence in women: A systematic review

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SUMMARY

Introduction: Strengthening exercises for pelvic floor muscles (SEPFM) are considered the first approach in the treatment of stress urinary incontinence (SUI). Nevertheless, there is no evidence about training parameters.

Objective: To identify the protocol and/or most effective training parameters in the treatment of female SUI.

Method: A literature research was conducted in the PubMed, Cochrane Library, PEDro, Web of Science and Lilacs databases, with publishing dates ranging from January 1992 to March 2014. The articles included consisted of English-speaking experimental studies in which SEPFM were compared with placebo treatment (usual or untreated). The sample had a diagnosis of SUI and their age ranged between 18 and 65 years. The assessment of methodological quality was performed based on the PEDro scale.

Results: Seven high methodological quality articles were included in this review. The sample consisted of 331 women, mean age 44.4±5.51 years, average duration of urinary loss of 64±5.66 months and severity of SUI ranging from mild to severe. SEPFM programs included different training parameters concerning the PFM. Some studies have applied abdominal training and adjuvant techniques. Urine leakage cure rates varied from 28.6 to 80%, while the strength increase of PFM varied from 15.6 to 161.7%. **Conclusion:** The most effective training protocol consists of SEPFM by digital palpation combined with biofeedback monitoring and vaginal cones, including 12 week training parameters, and ten repetitions per series in different positions compared with SEPFM alone or a lack of treatment.

Keywords: training, pelvic floor, urinary stress incontinence, women.

RESUMO

Protocolo de treino dos músculos do pavimento pélvico em mulheres com incontinência urinária de esforço: revisão sistemática

Introdução: Os exercícios de fortalecimento dos músculos do pavimento pélvico (EFMPP) são considerados a primeira intervenção no tratamento da incontinência urinária de esforço (IUE); porém, não existe evidência sobre os parâmetros de treino.

Objetivo: Identificar o protocolo e/ou os parâmetros de treino mais eficazes no tratamento da IUE feminina.

Método: A pesquisa bibliográfica foi realizada entre janeiro de 1992 e março de 2014 nas bases de dados PubMed, Cochrane Library, PEDro, Web of Science e Lilacs. Os artigos incluídos eram de língua inglesa, estudos experimentais, comparando EFMPP com tratamento placebo, usual ou sem tratamento, com idade compreendida entre 18 e 65 anos e diagnóstico de IUE. A avaliação da qualidade metodológica foi realizada por meio da escala PEDro.

Resultados: Sete artigos de elevada qualidade metodológica foram incluídos na presente revisão. A amostra foi constituída por 331 mulheres, com idade média de 44,4±5,51 anos, duração média das perdas urinárias de 64±5,66 meses e gravidade da IUE variando entre ligeira e grave.

Os programas de EFMPP eram distintos relativamente aos parâmetros de treino dos MPP. Alguns estudos incluíram treino abdominal e técnicas adjuvantes. A taxa de cura da quantidade de perda urinária variou entre 28,6 e 80%, enquanto o aumento da força dos MPP variou de 15,6 a 161,7%.

Conclusão: O protocolo de treino mais eficaz consiste nos EFMPP por palpação digital e supervisão combinados com *biofeedback* e cones vaginais, incluindo os parâmetros de treino de 12 semanas de duração, dez repetições por série e em distintas posições comparados com os EFMPP isolados ou sem tratamento.

Palavras-chave: treinamento, assoalho pélvico, incontinência urinária de esforço, mulheres.

INTRODUCTION

The International Continence Society (ICS) and the International Urogynecological Association define urinary incontinence (UI) as a symptom, namely “the complaint of any involuntary loss of urine.”¹ UI is classified according to the record of signs, symptoms and results from urodynamic study (UDS).¹ Stress urinary incontinence (SUI) is “the complaint of involuntary urine loss on effort or physical exertion, or on sneezing or coughing.”¹

Worldwide, SUI is predominant in females, and the mean prevalence in the various studies is 25%.^{2,3} It can, however, range from 10% in young women³ to 45% among the elderly.³

UI has a devastating effect on women’s quality of life in the physical, social, sexual and psychological spheres.⁴ Women restrict or diminish their activity and social participation, with serious implications.⁵

In SUI, there is an association between physical exertion and urinary loss.⁶ Increased intra-abdominal pressure triggered by physical exertion leads to increased intravesical pressure and, if it exceeds intraurethral pressure, in the absence of contraction of the detrusor muscle, the resulting urinary leakage is referred to as SUI.⁶⁻⁸ The pathophysiology underlying this condition follows two mechanisms: hypermobility of the urethra and bladder neck, and intrinsic deficiency of the urethral sphincter.⁷⁻⁹

The recommendations of the Agency for Health Care Policy and Research suggest that the first intervention in the treatment of SUI should be conservative. Pelvic floor rehabilitation includes behavioral modifications and advice on everyday life hygiene, intravaginal manual reeducation, strengthening exercises for pelvic floor muscles (SEPFM), electrical stimulation, biofeedback and vaginal cones.¹⁰ Rehabilitation of pelvic floor muscles (PFM) may be active and/or passive, but reeducation depends on a request of voluntary muscle contraction. Active exercises include SEPFM, intravaginal manual reeducation, vaginal cones and biofeedback, while passive exercise refers to electrical stimulation.¹⁰ Investigations¹¹⁻¹³ demonstrated similar effectiveness of different SEPFM programs, but no evidence of a specific, standardized program. These investigations differ regarding the parameters used in the training programs: eight¹⁴⁻¹⁶ to forty repetitions;¹⁷ two¹⁵ to five series;¹⁶ submaximal^{14,18} to maximum contractions;^{15,16} duration of five weeks¹⁶ to six months;¹⁴ three times a week¹⁴ to daily;¹⁹ instruction on muscle contraction using digital palpation;¹⁸ biofeedback¹⁹ or perineal ultrasound;²⁰ individual²⁰ or group sessions;²¹ supervised training¹⁴ or home practice.^{10,19,22} In general, SEPFM is effective in the treatment of female SUI; however, there is a great heterogeneity of programs, not allowing identification of the most effective protocol.

The objective of our review was to identify the most effective protocol and/or PFM training parameters to treat female SUI.

METHOD

The structural and content organization of our systematic review was based on the recommendations of the PRISMA statement.^{23,24}

Eligible studies were of an experimental nature comparing SEPFM to placebo, usual treatment or lack of treatment. They presented high methodological expressiveness (score ≥ 5 on the PEDro scale) and were written in English.

The participants were female, aged between 18 and 65 years, diagnosed with SUI based on subjective perception (symptom) and/or clinical evaluation (signal) and/or UDS (uroflowmetry and cystometry). Exclusion criteria included diagnosis of SUI triggered by factors external to the lower urinary tract (neurological pathologies, cognitive deficits), pregnant and postpartum women, \geq stage 2 prolapse in the Pelvic Organ Prolapse Quantification (POP-Q), and other types of UI (mixed and urgent).

Search strategy

The search covered five databases: PubMed (Medline), Cochrane Library, PEDro, Web of Science and Lilacs. In

addition, we conducted a manual survey from the bibliography of the articles, systematic reviews and meta-analyses included, as well as on the ICS website, in order to reduce publication bias.²⁵ Studies included were published between January 1992 and March 2014. The Medical Subject Headings (MeSH) of the National Library of Medicine enabled the identification and the combination of keywords pertaining to: the pathology (urinary stress incontinence), interventions (pelvic floor muscle training; pelvic floor muscle exercise; physical therapy; program; protocol; rehabilitation), population (women; female), and study design (randomized controlled trial; controlled clinical trial; comparative study; research design).

The final search choice included the following keywords: (pelvic floor muscle) AND (“education” OR “training” OR “education”[MeSH Terms] OR “training”) OR (pelvic floor muscle exercise) AND physical therapy OR physiotherapy OR protocol OR program OR rehabilitation AND (stress urinary incontinence) AND women AND female AND (randomized controlled trial OR controlled clinical trial OR comparative study OR research design) NOT (pregnancy OR animals).

Methodological quality

The methodological quality of the studies was analyzed by three independent researchers using the PEDro scale. This assessment tool has 11 items, with a maximum score of 10 points.²⁶ For each criterion presented in the scale (except for the first one), a score of 1 or 0 points can be attributed.²⁶ The PEDro scale was created by Moseley et al. in 1999 based on the *Delphi List*, and was translated and adapted for the Portuguese population by Costa in 2011.

RESULTS

Search strategy results

The search in the databases led to the identification of 591 potentially relevant studies (Figure 1).

Methodological quality results

The mean score for methodological quality evaluation was 5.7 ± 1.28 (min/max: 5/8) out of 10 points (Table 1).

The items that most contributed for the decrease of the total score were the 5 (blind study regarding the participants) and 6 (blind study regarding therapists) (Table 1).

Description of the studies

Our systematic review identified seven experimental studies. The studies were conducted between 1996 and 2013, with a total sample of 331 women.

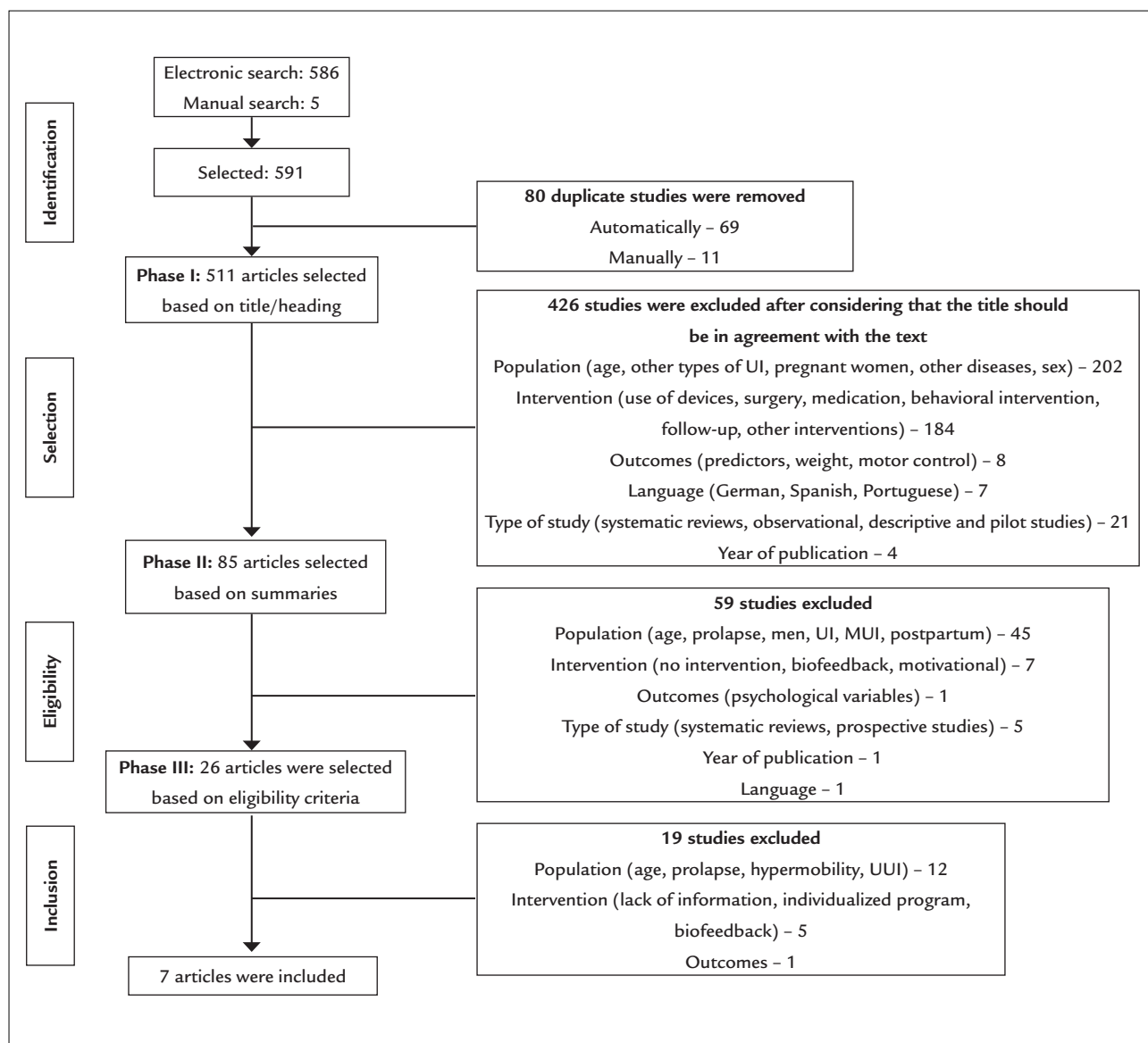


FIGURE 1 Study selection flowchart.

TABLE 1 Classification of the methodological quality of studies according to the PEDro scale.

Studies	1	2	3	4	5	6	7	8	9	10	11	Total
Glavind et al. ³⁰	1	1	1	1	0	0	0	1	0	1	1	6
Arvonen et al. ²⁹	1	1	0	1	0	0	0	1	0	1	1	5
Aksac et al. ¹⁹	1	1	1	1	0	0	0	0	1	1	0	5
Zanetti et al. ¹⁸	1	1	1	1	0	0	0	1	0	1	1	6
Felicíssimo et al. ³¹	1	1	1	0	0	0	0	1	0	1	1	5
Sriboonreung et al. ²⁸	1	1	1	1	0	0	0	1	0	1	0	5
Kamel t al. ²⁷	1	1	1	1	0	0	1	1	1	1	1	8

Note: 1. Eligibility criteria have been specified; 2. Participants were randomly assigned to groups; 3. The distribution into groups was blinded; 4. The groups were initially similar in relation to the most important prognostic indicators; 5. Blind study regarding the participants; 6. Blind study regarding therapists; 7. Blind study regarding evaluators who measured at least one key result; 8. Measurements of at least one key outcome were performed on more than 85% of participants initially allocated to groups; 9. All participants for whom outcome measures were presented received treatment or control intervention as planned or, whenever this was not the case, data were analyzed for at least one of the key outcomes by "intention to treat"; 10. The results of the inter-group statistical comparisons were described for at least one outcome; 11. The study presents measurement points and variation measurements for at least one key result.

Characteristics of the studies

Sample size varied between 30²⁷ and 68²⁸ women, with a mean age of 48.8±5.51 years, ranging from 25 to 65 years.²⁷⁻³⁰ The mean duration of urine loss was 64±5.66 months^{18,29,31} with severity ranging from mild^{19,27} to severe (even though the definition of the severity of UI is not expressed).³⁰

The diagnosis of SUI was demonstrated through subjective evaluation/symptoms (questionnaire, interview),^{19,27,29,31} physical examination/signs (pad test, gynecological evaluation)^{19,27-31} and/or UDS.^{18,19,27,31}

Interventions

In most studies, the program began with instructions for contracting PFM. Methods most often used were digital palpation^{19,27,31} and teaching of the anatomy and function of PFM.²⁹⁻³¹ Only one study used biofeedback,¹⁹ while two omitted the teaching of contraction.^{18,28}

Two studies combined SEPFM and biofeedback,^{19,30} one combined the exercises with vaginal cones,²⁹ two compared SEPFM supervised or not,^{18,30} and other two compared the exercises with and without the activation of abdominal muscles.^{27,28} SEPFM program parameters included length of contractions, which ranged from 1 s²⁸ to 20 s²⁹, length of rest from 1 s¹⁸ to 20 s^{19,27} and number of series, ranging from 2²⁷ to 40.¹⁹

Three studies used maximum contractions^{27,28,31} and two applied a combination of submaximal and maximum contractions.^{18,29} As for training positions, the one most often used was supine,^{18,19,27,30,31} followed by standing,^{18,29-31} seated^{18,29-31} and lateral decubitus position.³¹ Two studies, however, did not specify a training position.^{19,28}

Regarding the frequency of sessions, the minimum applied was two sessions per week,³⁰ while daily treatment was the most frequent.^{18,19,28,29,31}

The analyzed programs lasted between 8^{19,31} and 16 weeks,²⁹ and most opted for a 12-week duration.^{18,27,28,30}

Instruments used to measure outcomes

Almost all of the studies (6 out of 7) assessed the amount of urine leakage based on 1-hour and 24-hour pad tests.^{18,19,28-31} PFM strength was assessed by digital palpation^{19,29,31} and perineometry (vaginal squeeze pressure)^{19,27,28} while intrinsic sphincter was assessed by UDS.²⁷ Other outcomes included a subjective assessment based on a visual analogue scale,¹⁹ quality of life scales (QV-I-QOL, QV-ICIQ-SF)^{18,31} and voiding diaries.¹⁸

Cure rate results

Six studies^{18,19,28-31} displayed their assessments of cure rates measured by pad test ranging between < 1 g^{19,30} and < 2 g.^{18,29,31}

The results of cure rate according to the type of intervention were: 50% (cones) versus 26% (PFM Training – PFMT),²⁹ 36.6% (supervised PFMT) versus 34.5% (unsupervised),³¹ 58% (PFMT+biofeedback) versus 20% (PFMT);³⁰ 48% (PFMT+supervision) versus 9.5% (unsupervised);¹⁸ 75% (PFMT+palpation) versus 80% (PFMT+biofeedback) versus 0% (no treatment).¹⁹ For intervention periodicity, cure rates were 28.6% (daily PFMT) versus 21.2% (PFMT three times weekly) versus 20% (abdominal training)²⁸ (Table 2).

On perineometry, PFM strength increased to 84.7% (PFMT+palpation) versus 161.7% (PFMT+biofeedback) versus 7% (no treatment);¹⁹ 15.6% (SEPFM) versus 4.7% (abdominal muscle strength)²⁷ and 63.4% (daily) versus 48.4% (three times weekly) versus 59.7% (SEPFM+abdominal, three times weekly).²⁸ On digital palpation, PFM strength reached 37.5% (digital palpation) versus 48.9% (biofeedback) versus 0% (no treatment);¹⁹ 33% (SEPFM) versus 0% (vaginal cones);²⁹ and 50% (supervised) versus 50% (unsupervised).³¹ On UDS, intraurethral pressure increased 16% (abdominal muscle strength) versus 9.1% (SEPFM)²⁷ (Table 2).

Subjective perception of cure increased from 23.8¹⁸ to 75%.²⁸

DISCUSSION

Our systematic review confirmed the diversity in study designs, measurement instruments, cure rate definitions, and intervention outcomes.

Zanetti et al.¹⁸ found that supervised SEPFM were more effective than unsupervised SEPFM, unlike another study,³¹ which demonstrated the equal efficacy of both. The heterogeneity of the results may derive from the different manners of measuring the pad test (24-h and 1-h) and the duration of the interventions (8 and 12 weeks), respectively.^{18,31} The pad test is an instrument that reveals the amount of urinary leakage in grams, in addition to being inexpensive and non-invasive.³² According to Jørgensen et al.,³³ the correlation coefficient varies between 0.68 and 0.93.³³ The investigations are inconsistent regarding pad test application duration (1-h or 24-h), although some guidelines recommend the long-duration pad test (24 hours) as it allows the reproduction of urine losses during daily activities according to an individual's bladder capacity, compared with the 1-hour pad test, which requires a standardized bladder volume and provokes urine leakage in distinct physical activities.³²

In our review, combined therapy with SEPFM and abdominal muscle strengthening training significantly increased PFM strength, as proven by perineometry ($p < 0.05$).^{27,28} However, there were no statistically significant differences in reducing the amount of urine leakage.²⁸

TABLE 2 Summary of the description of the studies according to intervention, results and conclusions.

Study	Groups	Severity	Outcomes	Results		Inter-groups	Definition of cure	Rate of cure	Main conclusions
				Pre-intervention	Post-intervention				
Glavind et al. ³⁰	G1: SEPFM + biofeedback G2: SEPFM	Mild to severe	Pad test 1h (g)	G1: 9.0 (5-22); G2: 12.8 (9-44)	G1: 0.8 (0-4); G2: 10.0 (2-27)	p=0.02	Pad test ≤ 1 g	G1: 58% G2: 20%	Combined treatment of biofeedback with SEPFM showed a significant reduction of urinary loss compared to SEPFM alone.
Arvonen et al. ²⁹	G1: SEPFM G2: Vaginal cones	NR	Pad test 1h (g) Digital palpation (0-5) Subjective assessment of cure (0-100%)	G1: 20; G2: 30 G1: 3; G2: 3 NR	G1: 5; G2: 1 G1: 3; G2: 4	p=0.03 p=0.05	Pad test < 2 g	G1: 26% G2: 50%	Treatment with vaginal cones has significantly reduced the amount of urinary loss compared to SEPFM.
Aksac et al. ¹⁹	G1: SEPFM via digital palpation G2: SEPFM via biofeedback G3: no treatment	Mild and moderate	Pad test 1h (g) Perineometry (cmH ₂ O) Digital palpation/Oxford scale (0-5) Subjective assessment – VAS (0-10 points)	G1: 19.9±2.5; G2: 20.5±0.7; G3: 29.1±3.2 G1: 20.3±6.2; G2: 19.1±4.8; G3: 18.7±4.9	G1: 2.1±0.4; G2: 1.2±0.2; G3: 28.2±3.7 G1: 37.5±8.7; G2: 50.0 ±11.5; G3: 20.0±3.9	p<0.001 p<0.001	Pad test < 1 g	G1: 75% G2: 80% G3: 0%	SEPFM combined with digital palpation or biofeedback are effective compared to the untreated group.
Zanetti et al. ¹⁸	G1: Supervised SEPFM G2: Unsupervised SEPFM	NR	Pad test 1h (g) QV-1-QoL Voiding diary Subjective assessment	G1: 20.1; G2: 24.7 G1: 69.0; G2: 82.0 G1: 7.0; G2: NA	G1: 3.2; G2: 15.0 G1: 89.0; G2: 79.0 G1: 1.0; G2: 10.0 G1: 66.7%; G2: 23.8%	p=0.002 p=0.046 p<0.0002	Pad test < 2 g	G1: 48% G2: 9.5%	The supervised SEPFM group improved significantly compared to the unsupervised SEPFM group.

(continues)

TABLE 2 (cont.) Summary of the description of the studies according to intervention, results and conclusions.

Study	Groups	Severity	Outcomes	Results		Inter-groups	Definition of cure	Rate of cure	Main conclusions
				Pre-intervention	Post-intervention				
Felicissimo et al. ³¹	G1: Supervised SEPFM	NR	Pad test 24h	G1: 4.5 (3.0-15.7); G2: 9.3 (3.3-36.1)	G1: 3.2 (1.2-8.0); G2: 2.8 (1.5-8.5)	p=0.78	Pad test < 2 g	G1: 36.6% G2: 34.5%	Supervised and unsupervised SEPFMs were equally effective, with prior teaching of the correct contraction of PFM.
	G2: Unsupervised SEPFM		Digital palpation/Oxford scale (0-5) QV-ICIQ-SF (0-21)	G1: 2.0 (2.0-3.0); G2: 2.0 (2.0-3.0) G1: 14.0 (9-16); G2: 14.0 (10-16)	G1: 3.0 (3.0-4.0); G2: 3.0 (2.0-4.0) G1: 8.0 (6-12); G2: 8.0 (5-13)	p=0.20 p=0.76			
			Subjective assessment of cure (0-100%)	NA G1: 69%; G2: 70%					
Sriboonreung et al. ²⁸	G1: Daily SEPFM	NR	Pad test 1h (g)	G1: 4.0±0.9; G2: 4.0±1.5; G3: 4.7±1.6	G1: 1.4±0.7; G2: 1.7±0.7; G3: 4.7±1.6	p>0.05	Pad test	G1: 20% G2: 21.2% G3: 28.6%	Daily SEPFM significantly increased PFM strength compared to the three times weekly frequency group and the abdominal training group. However, all groups reduced the amount of urine leakage.
	G2: SEPFM, three times weekly		Perineometry (cmH ₂ O)	G1: 29.0±10.2; G2: 28.7±13.1; G3: 29.0±7.4	G1: 47.4±9.6; G2: 42.6±12.4; G3: 46.3±8.2	p<0.001			
	G3: SEPFM + abdominal muscle strength, three times weekly		Subjective assessment of cure (0-100%)	NA G1: 75%; G2: 68.4%; G3: 66.7%					
Kamel et al. ²⁷	G1: Abdominal muscle strength	Mild	Perineometry (cmH ₂ O)	G1: 49.9±4.85; G2: 50.3±6.06	G1: 57.73±6.39; G2: 52.60±7.60	p>0.05	NR	NR	Abdominal training significantly increased PFM strength compared to SEPFM.
	G2: SEPFM		Valsalva LPP (cmH ₂ O)	G1: 80.00±5.52; G2: 78.00±4.49	G1: 92.80±13.57; G2: 87.33±9.07	p=0.058	NR	NR	

According to Sapsford et al.,³⁴ training of deep abdominal muscles triggers the co-contraction of PFM, causing an increase in the strength of PFM and an improvement in urinary continence. A systematic review by Kari Bø et al.³⁵ concluded that the results are ambivalent because, to date, there is no strong clinical evidence of benefit with abdominal muscle training in women with UI.

In the studies included in the review, PFM training programs including adjuvant therapies such as biofeedback, digital palpation and vaginal cones reach high rates of cure (80, 50 and 58%, respectively).^{19,27,31} A systematic review by Neumann et al.³⁶ demonstrated that SEPFM combined with adjuvant therapies were effective in the treatment of SUI, reaching a cure rate of 73%. These PFM strengthening techniques allow identification, awareness of correct muscle contraction, and inhibition of synergistic muscles, enhancing results.³⁷

The PFM training programs differed in the following parameters: type of muscle contraction, number of repetitions and series, rest time between each contraction, time of contraction and progressivity of the exercises. Nevertheless, most of the studies that were analyzed showed consistency in the repetition frequency parameter (ten initial repetitions), except for the study by Kamel et al.,²⁷ who initiated the SEPFM program with 15 repetitions. This parameter corroborates the parameters of strength training to obtain muscular hypertrophy advocated by the American College of Sports Medicine,^{38,39} which recommends 8 to 12 contractions per series.

The frequency of SEPFM was predominantly intensive (one to three times per day), but the study by Sriboonreung et al.²⁸ failed to verify significant differences in reducing the amount of urine leakage by using different frequencies of SEPFM. The current evidence for the principles of strength training recommends that the frequency of three times weekly is sufficient for muscle hypertrophy.^{38,39}

In most studies,^{18,27,28,30} the training program duration was 12 weeks, except for two studies^{19,31} that applied SEPFM for 8 weeks. According to the recommendations of the American College of Sports Medicine, strength training programs should last at least 15-20 weeks.³⁸ PFM are skeletal muscles and, therefore, the recommendations of strength training are not different from other skeletal muscles.¹² In the first 8 weeks of training, the changes are essentially neural (increased number and frequency of motor unit activation), followed by muscle hypertrophy due to increased volume and number of myofibrils, essential for morphological or structural adaptations.³⁶ In our systematic review, training programs of 8 to 12 weeks seem to reduce the amount of urine leakage, and/or to

increase PFM strength, inferring that short-term training is equally effective in the treatment of SUI. However, these results should be analyzed with caution, because the gain of muscular strength in this period was sustained by an increase in number and synchronism of the motor units,³⁶ without any mention of patient follow-up after training, in addition to the fact that the studies included in the analysis used different designs, eligibility criteria and measuring instruments. Also, some of the studies^{28,29} in our review demonstrated that increasing the strength of PFM in this short period of time may not be related to a significant reduction in the amount of urine loss. This suggests that the increase in PFM strength and urethral resistance does not seem to guarantee the mechanism of urinary continence.^{28,29} According to some authors, coordination between early contraction of PFM and increased intra-abdominal pressure may be the most relevant factor in reducing urine leakage compared to the strength gain of PFM, which may justify the positive results of short training programs.^{7,40}

We found in our review that five studies used different positions to perform the exercises, so that the most commonly applied ones were the standing, seated and lateral decubitus positions.^{18,27,29-31} One of the ways to promote the progression of the exercises is to create different levels of difficulty (without and against gravity).¹¹ According to Kari Bo et al.,⁴¹ a standing position increases pressure on the bladder and PFM, and may decrease the effectiveness of PFM contraction, affecting the reduction of muscle strength.

According to recent studies,^{42,43} the PFM contraction reflex to increased intra-abdominal pressure may be inherent to the mechanism of urinary continence, but coordination of the different patterns may be acquired as a learned behavior and is currently considered complementary to SEPFM, a determining factor in any PFM reeducation protocol.

The literature cites cure rates ranging from 44 to 70%.^{13,18,44} In our systematic review, the objective cure rate varied between 20^{28,30} and 75%,¹⁹ while the subjective cure rate ranged between 23.8¹⁸ and 75%.²⁸ The low cure rate can be justified by different definitions of cure using pad test (< 1 g or < 2 g). On the other hand, variations in cure rates also depend on different levels of severity of SUI,⁴⁵ training program duration,²² initial PFM strength⁴² and patient adherence to treatment.^{22,46}

CONCLUSION

SEPFM combined with digital palpation, biofeedback and vaginal cones, as well as 12-week duration training

parameters, with ten repetitions per series and in distinct positions seemed more effective to reduce the amount of urine leakage, also providing a subjective perception of cure compared with SEPFM alone or a lack of treatment. The limited number of studies and the heterogeneity of the intervention protocols did not allow us to identify the most effective PFM training protocol.

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