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Research

Strategies to enhance self-efficacy and adherence to home-based pelvic floor muscle exercises did not improve adherence in women with urinary incontinence: a randomised trial

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KEY WORDS

Exercise
Pelvic floor
Urinary incontinence
Adherence
Self-efficacy

ABSTRACT

Question: Do strategies to enhance self-efficacy and exercise mastery affect adherence to home-based pelvic floor muscle exercises in women with urinary incontinence? **Design:** Two-arm, parallel, randomised, controlled trial with intention-to-treat analysis. Randomisation was performed using computer-generated random numbers in five blocks of 20 women. **Participants:** Eighty-six women with stress, urgency or mixed urinary incontinence. **Intervention:** All participants underwent three individual physiotherapy clinic visits at Day 0, 15 and 30, and 2 further months of home-based pelvic floor muscle exercises. The experimental group also received self-efficacy enhancing interventions, including a structured discussion on accomplishments and goals, a 9-minute video with testimonials, and a reminder. **Outcome measures:** The primary outcome – adherence to at least 20 fast and 20 slow contractions every day – was evaluated with a structured questionnaire at 15, 30 and 90 days after enrolment and completion of a daily diary. A validated questionnaire was used to assess urinary incontinence. Self-efficacy and pelvic floor muscle function were also measured. **Results:** Seven women withdrew from each group before the Day-30 assessment. There was no difference in adherence to pelvic floor muscle exercises at 90 days between the groups (MD 0.5 points, 95% CI −1.1 to 2.1) on the questionnaire, which was scored from 2 to 21. At Day 90, 56% of the experimental group and 44% of the control group were performing the exercises every day. Adherence scores of both groups decreased during the 2-month follow-up period without any supervised physiotherapy session ($p < 0.05$). The groups did not differ on the remaining secondary outcomes. **Conclusion:** Discussion of accomplishments and goals, a testimonial video and a reminder did not increase exercise adherence more than exercise mastery. **Trial registration:** Brazilian Registry of Clinical Trials UTN:U1111-1128-8684. **[Sacomori C, Berghmans B, Mesters I, de Bie R, Cardoso FL (2015) Strategies to enhance self-efficacy and adherence to home-based pelvic floor muscle exercises did not improve adherence in women with urinary incontinence: a randomised trial. *Journal of Physiotherapy* 61: 190–198]**

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Introduction

Pelvic floor muscle exercises (PFME) are strongly recommended for the management of all types of urinary incontinence, but to be effective they require adherence.[1–3] Systematic reviews have shown that more intensive and supervised programs are more effective for treating urinary incontinence than non-supervised programs.[1,2,4] However, some trials have found similar results for both supervised and non-supervised interventions.[5,6] Non-supervised, home-based practice of PFME would be ideal for women who find it difficult to go to treatment centres. Adherence is an important aspect of home-based practice of PFME to treat urinary incontinence. Adherence is defined as the extent to which a person's behaviour corresponds with agreed recommendations from a healthcare provider.[7]

Adherence is often linked to self-efficacy; therefore, self-efficacy is a construct that is frequently targeted in behavioural change interventions. It is important to distinguish between general self-efficacy (ie, one's perceived ability to achieve what one undertakes) and self-efficacy with a specific task. For example, an individual may score differently in general self-efficacy compared with self-efficacy restricted to a particular task.

A woman's belief in her own ability to perform PFME is an important predictor of adherence to PFME.[8,9] Therefore, in this study, the concept of 'self efficacy' was defined as this specific perceived ability to perform PFME every day at home.

People use four sources of information to judge their efficacy: vicarious experiences; verbal persuasion; mastery experience (based on performance outcomes); and physiological or psychological feedback.[10] The latter two sources, which provide women with the experience they need to master PFME, are considered to be the most effective in improving self-efficacy. Through experiencing failures and, ultimately, success in performing PFME, women can learn that they can achieve this task with sustained effort.[10]

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Three clinical trials have investigated the use of additional prompts to improve adherence to PFME.[8,11,12] Two of the studies prompted the performance of PFME with an electronic reminder, which increased adherence to non-supervised exercises at home according to instructions given in one session.[11,12] The other study found no improvement in adherence to home-based exercises when health education brochures and reminders were added to supervised PFME sessions in which personal health counselling was monitored and optimised.[8] Therefore, the effects of reminders for PFME remain inconclusive.

Therefore, the research question for this study was:

In women with urinary incontinence who underwent a PFME training program with three physiotherapy supervised sessions, do strategies to enhance self-efficacy and adherence (ie, learning video, reminders and goal setting) and exercise mastery (ie, personal persuasion, performance outcomes and physiological feedback during treatment sessions) improve adherence to home-based PFME?

Method

Design

A randomised, controlled trial was performed in Florianópolis, Brazil, between April 2012 and August 2013. All participants received three sessions with a physiotherapist on Days 0, 15 and 30. These sessions involved PFME, instructions on how to deal with urinary incontinence, and instructions to perform PFME every day at home. Only those participants who were randomised to the experimental group also received additional strategies to enhance self-efficacy in PFME: a video that modelled success with PFME through women presenting testimonials; a reminder magnet; and a goal-setting discussion, which occurred in the follow-up period.

Women who attended either primary care doctors and nurses or secondary care urologists or gynaecologists from the Florianópolis region public health system were referred to this study. Recruitment advertisements were also placed in hospitals. Women voluntarily contacted the researchers by telephone and scheduled an evaluation. After screening for eligibility, the participants were allocated to the next available allocation by the enrolling researcher. Allocation of participants to groups was randomised using five blocks of 20 computer-randomised allocations prepared by an independent person. Participants were allowed to continue other usual healthcare. The use of hormone replacement therapy and medication for the management of urinary incontinence was recorded.

Participants and therapist

The trial included women aged > 18 years, with symptoms of urinary incontinence and a mini-mental score > 24, indicating good cognitive functioning.[13] Exclusion criteria were: pregnancy or postpartum period ($<$ 6 months after delivery), virginity, illiteracy, any observed vaginal prolapse that exceeded the hymenal area, any urogenital infection, women unable to contract their pelvic floor muscles (scored 0 on the Oxford Modified scale,[14] signifying no discernible muscle contraction), vaginal atrophy that impeded the insertion of two fingers into the vaginal cavity, and any systemic disorder, including diagnosed cancer or neurological diseases.

One physiotherapist, who had 6 years of experience and 2 years of specific experience in treating incontinence, provided all of the three supervised sessions for each participant.

Intervention

The experimental intervention used in this study was devised to incorporate the four principal sources of information that were proposed by Bandura[10] to influence self-efficacy: mastery experience, vicarious experience, verbal persuasion, and physiological and emotional states (Table 1). It is important to note that performance accomplishments and verbal persuasion are inherent to any physiotherapeutic approach. Most physiotherapists try to convince their patients about the importance of exercising by offering mastery training while constantly providing feedback to them. Therefore, the main sources for self-efficacy – persuasion, mastery experience and feedback – can be achieved during supervised exercise sessions. In addition to that, however, the experimental group received the following interventions: a video with testimonials from women, which acted as a model of success with PFME; a magnet reminder as a prompt; and a structured discussion about short-term and long-term goals, intended to enhance independent performance of PFME. The control group also had treatment targets, as they are inherent to any physiotherapeutic approach, but the experimental group had the specific goals and achievements registered in their diaries.

The three physiotherapy sessions delivered to both groups included: breathing and body awareness exercises in front of a mirror with a gym ball to help locate the pelvic floor muscles and to practise pelvic movements; instruction of PFME during vaginal palpation; discussion of factors associated with urinary incontinence, bladder hygiene, and how to deal with them; use of a device[aa] to provide visual and pressure biofeedback; and training to contract the pelvic floor muscles before situations that increase intra-abdominal pressure (known as the 'knack').[15] All participants received a folder with information about how to deal with urinary incontinence and how to perform the exercises. This folder was specifically created for this study and three experts in urinary incontinence treatment evaluated its content.

Construction of the exercise protocol was adapted from the regimen used in the randomised trial by Bø and colleagues, which established the efficacy of PFME.[16] Bø and colleagues instructed participants to perform a daily total of 24 to 36 slow contractions (high-intensity maximal voluntary contraction with a 6 to 8 seconds hold). Each slow contraction was followed by three to four fast contractions and then 6 seconds of rest. The PFME protocol used in the present study therefore differs from the regimen of Bø and colleagues because the fast contractions were not performed immediately after each slow contraction. Instead, at the first treatment session, participants were instructed to perform at least 20 repetitions every day of each of the following exercises: close-to-maximal contraction maintained for up to 10 seconds (ie, slow contractions); and close-to-maximal contraction and subsequent relaxation (ie, 1-second fast contractions). Aiming at overload, participants were instructed to increase the number of repetitions after each supervised session, according to their abilities, and to adopt different body positions for exercise: supine, sitting, standing or semi-squatting. Participants were advised that they could choose to perform the exercises in one or more sets a day and whether to do the slow or fast contractions first. The number and duration of contractions was individualised according to each participant's abilities. Patients were encouraged to actively use the 'knack'.[15] Participants were instructed to rest for the same duration as the duration of the preceding contraction.

Outcome measures

In order to characterise the participants at baseline, sociodemographic and clinical variables were obtained. The sociodemographic variables included: age, marital status, education level, income, ethnicity, perceived health status, smoking status, physical activity during leisure time, and sexual activity with a partner. The clinical variables were parity, body mass index, comorbidities, menopause management, gynaecological surgery, pelvic floor muscle strength, pelvic floor muscle endurance, type of urinary incontinence, frequency of urinary incontinence and amount of urinary incontinence.

The primary outcome was adherence to PFME at Day 90. Adherence was also assessed at Days 15 and 30. Other secondary

Table 1
Description of the intervention to enhance self-efficacy.

Sources of information for self-efficacy, as proposed by Bandura[10]	Methods to enhance each source, as proposed by Bandura[10]	Interventions used in this study
Mastery experience (most effective source to improve self-efficacy) • It is a process of learning with success and failures; success raises self-efficacy, whereas repeated failures lower it • Individuals acquire skills to deal with stressful situations and overcome barriers • Individuals learn more when they are exposed to the required performance (in this case PFME)	1. Enactment over graduated temporal intervals 2. Joint performance with the therapist 3. Tasks could be graduated, gradually increasing the difficulty level 4. Self-instructed performance	**Both groups** 1. Participants joined three PT-supervised individual sessions, at intervals of 15 days, in which PFME were performed (S2 and S3). 2. At supervised encounters, the PT assisted participants in the performance of exercises and checked contractions by vaginal palpation. Feedback regarding pelvic floor muscle contraction was given to the participant (S2 and S3). 3. In each supervised session, the PT asked participants to gradually increase the number of repetitions of home-based PFME in order to improve PFM strength and endurance, and also reduce UI (S2 and S3). 4. The PT encouraged participants to keep doing the exercises at home and to try to improve them. Participants were asked to fill out an exercise diary to enhance self-instructed performance (S2 and S3). **Experimental group only** 4. Goal setting to enhance self-instructed performance: Participants were encouraged to write their achievements in their diaries and to set short-term and long-term goals regarding treatment (S2 and S3). 4. Feedback to enhance self-instructed performance: The therapist further discussed these achievements with participants and helped to analyse and think about ways to overcome difficulties, by interpreting success and failures (S2 and S3).
Vicarious experience (less effective) • Refers to learning by seeing others perform difficult activities • It is a mechanism of social comparison	1. Seeing the successful performances of others without adverse consequences	**Both groups** 1. Neither group was restricted from situations that could affect their vicarious experience: talking to other women with the same problem who improved or not after PT treatment, watching TV programs or seeking health professional opinion about the effects of PFME. **Experimental group only** 1. A 9-min video with testimonial from women indicating that their UI and sexual function improved after performing home-based PFME (S1).
Verbal persuasion (less effective but easy and readily available) • Through suggestion people are led to believe that they can do something • Helps to improve outcome expectation	1. Therapist suggestion (credible person) 2. Other social persuasion	**Both groups** 1. The PT tried to persuade participants to perform PFME at home (S1, S2 and S3). 2. At re-evaluations, participants were asked whether they were receiving other social persuasion – whether someone else was encouraging them to perform the exercises (S2 and S3).
Emotional arousal • Stressful and taxing situations generally cause emotional arousal and can affect perceived self-efficacy in coping with difficult situations • Individuals are more likely to experience success when they are unaffected by aversive arousal (feeling tense and agitated)	1. To identify negative emotions, such as fear and anxiety 2. Behavioural control of emotions, such as fear and anxiety, allows management of unpleasant environmental aspects [a]	**Both groups** 1. At re-evaluations, participants were asked about their general mood state on preceding days (S2 and S3). 1. Analysis with the participants of the situations in which UI occurred were reported in the diary. In the case that the situation was related to emotional arousal (stressful situation), the PT exhibited empathy and encouraged the participant to try to actively control her emotions in order not to worsen the situation with the feeling of shame after urine leakage (S2 and S3).
Sociostructural factors • Facilitators and barriers to exercise	1. Reinforcement is used to overcome the most commonly cited barrier to performing PFME, which is forgetting	**Experimental group only** 1. Participants received a cue to action – a magnet designed to remind them about the exercises. It contained the phrase 'Remember to perform your exercises today. You can do it!'. The therapist took some time to reinforce the need to perform the exercises daily, trying to verbally persuade participants to use the magnet as a reminder (S1).

PT = physiotherapist, PFME = pelvic floor muscle exercises, S1 = first PT-supervised session, S2 = second PT-supervised session (15 days after S1), S3 = third PT-supervised session (1 month after S1), UI = urinary incontinence.
[a] This method was not incorporated into this study because it is more related to a psychotherapeutic approach.

outcomes were urinary incontinence (frequency, amount and urinary incontinence impact on quality of life), and pelvic floor muscle strength and endurance. These were assessed at baseline and at Days 15, 30 and 90. Self-efficacy was assessed at Day 90.

Adherence

Adherence to PFME was obtained from a structured questionnaire, which was validated for content and then pilot tested.[9] This instrument consisted of three items. The first item was time spent practising PFME, which was recorded on a five-point scale: 1 = none; 2 = < 5 minutes; 3 = 5 to 10 minutes; 4 = 10 to 20 minutes; and 5 = > 20 minutes. The second item was the number of daily contractions recorded on a six-point scale: 1 = none; 2 = < 30 repetitions; 3 = 30 to 60 repetitions; 4 = 60 to 90 repetitions; 5 = 90 to 120 repetitions; and 6 = 120 to 200 repetitions. The third item was a self-perceived rating of adherence to PFME using a visual analogue scale from 0 (not at all compliant) to 10 (completely compliant). Adherence was scored by summing the three items, with a range from 2 to 21, where higher scores indicated stronger adherence to PFME.

Participants were also provided with an exercise diary in which to record the number of repetitions per day and the number of days per week on which they practised the PFME. These data were used for triangulation to verify the validity of the data collected with previous instruments.

This adherence scale was adopted in an attempt to standardise adherence measures. Other questions obtained from the exercise diary have been used for triangulation. A strong correlation was obtained between the adherence score and the criteria from the diary: number of days per week of exercise (Spearman's rho = 0.63, $p < 0.001$), number of slow contraction repetitions (Spearman's

rho = 0.64, $p < 0.001$) and number of fast contraction repetitions (Spearman's rho = 0.61, $p < 0.001$).

Self-efficacy

In a previous study, a self-efficacy scale for practising PFME with women that underwent screening for cervical cancer and postpartum women was developed and validated.[17] This measure was taken at a 3-month follow-up.

The validation process included content, internal consistency, dimensionality and reliability analysis. The scale contained 17 questions in the format of a visual analogue scale with answers ranging from 0 (not confident at all) to 100 (the most confident). Thirteen items referred to self-efficacy and four to outcome expectation. The final scores were obtained by calculating the mean of the items, ranging from 0 to 100, in which higher values were equivalent to more beneficial self-efficacy/outcome expectation to PFME.

Urinary incontinence

The International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF), proposed by Avery and colleagues,[18] which was translated and validated into Portuguese,[19] was used. It measured the frequency and amount of urine loss, and the score indicated to what extent urinary incontinence affected quality of life. The score ranged from 0 (no incontinence) to 21 (maximal symptoms and impact). One of its questions investigated situations where urinary incontinence occurred and, from this question, women were classified as mainly presenting with symptoms of stress, urgency or mixed urinary incontinence. Urine loss while coughing and sneezing or during physical activities was indicative of stress urinary incontinence, while urine loss immediately after urination, during sleep or without obvious reason indicated urge urinary incontinence.

Pelvic floor muscle function

Pelvic floor muscle strength was measured by vaginal palpation and graded on the Oxford Modified Scale from 0 (no contraction) to 5 (strong).[14] Endurance was evaluated by instructing the participants to maintain a maximal voluntary contraction until they could not continue.[20] The number of seconds for which the participants could sustain the contraction was registered.

Three research assistants helped the participants to complete the questionnaires. They were trained not to influence the participants' answers by being neutral during the interview and by asking the participants to be sincere. These research assistants were not blinded to the participants' group allocation.

Data analysis

Data were analysed with descriptive (frequencies, mean, standard deviation, median, inter-quartile range, 95% CI of mean/median differences) and inferential techniques. The 95% CIs around median differences were calculated using Hodges-Lehmann estimation. Intention-to-treat analyses were performed. In the case of missing values, data were completed with single imputation procedures using the mean of the group that the participant was allocated to.[21] Data were evaluated regarding normality criteria. First, observed group differences were analysed using the Student's t-test or Mann-Whitney U test. Second, to compare the means of adherence between the follow-up periods, ANOVA for repeated measures with Bonferroni post hoc analyses was used. All analyses considered a significance level of 0.05. The sample size required was calculated based on the results of the study by Chen and Tzeng.[9] These authors used the same scale to measure adherence to PFME with only one exercise group and obtained a mean of 11.85 and a standard deviation of 4.29, with scores ranging from 2 to 21. A 25% difference in between-group mean, equivalent to three points on the scale, was considered to indicate a clinically important difference. All calculations assumed a two-sided effect, with an alpha of 0.05 and power of 80%. A total sample size of 68 women was calculated and, assuming a dropout rate of 20%, the desired sample size at enrolment was 86 women. The adherence score at 3 months of follow-up was selected as the primary outcome in order to standardise adherence measurements related to PFME.

Results

Flow of participants through the study

Figure 1 shows the study flow after 106 women had been assessed for eligibility; 86 were randomised. By Day 15, six participants in the experimental group and seven in the control group had dropped out of the study. By Day 30, another participant in the experimental group had dropped out. Baseline characteristics are presented in Tables 2 and 3. Most of the participants cohabited with a partner, had a low level of education, low income, presented symptoms of stress or mixed urinary incontinence, and were overweight or obese. The mean age was 50 years (SD 11).

Do strategies to enhance self-efficacy, used in addition to exercise mastery, improve adherence to home-based PFME in women with urinary incontinence?

No significant between-group differences were identified at 15, 30 or 90 days in any of the adherence measures: adherence score (Figure 2, Table 4), duration of exercises (Table 5, see eAddenda for Table 5), number of repetitions and number of exercising days/week (Table 6). Self-efficacy and outcome expectations also did not differ between groups (Tables 4 and 6).

Regarding other secondary outcomes, the changes from baseline of urinary incontinence severity (ICIQ-SF), pelvic floor muscle strength and endurance were also similar between groups (Tables 7 and 8). At baseline, the impact of urinary incontinence on quality of life (ICIQ-SF score) was high, with a median of 15 points (IQR 12 to 17) in both the experimental and control groups. At Day 30, a significant between-group difference on the ICIQ-SF score was found ($p = 0.035$); the experimental group had lower scores, meaning that they felt urinary incontinence to be less bothersome than the control group. However, no differences between groups in ICIQ-SF scores were found at Days 15 or 90.

Adherence scores were high for both groups (Table 4). Figure 2 shows that adherence slightly increased after the second supervised training session and significantly diminished during the period in which participants went 2 months without any physiotherapeutic supervision (experimental group: F = 7.1, df = 2, $p = 0.003$; control group: F = 3.9, df = 2, $p = 0.024$). Bonferroni post hoc test located these mean differences only between the Day 30 and Day 90 evaluations.

Regarding the effect of the non-supervised treatment on urinary incontinence, in both the control and experimental groups, 12 participants (28%) finished the treatment dry, without any urinary incontinence symptoms (ICIQ-SF post intervention = 0). Meanwhile, 20 participants (47%) in the experimental group and 21 (49%) in the control group presented a decrease in their ICIQ-SF score; three participants (7%) in each group reported no changes in ICIQ-SF score, one participant (2%) in the experimental group reported an increase in ICIQ-SF score, and drop-out for both groups was seven women (16%).

Discussion

This trial assessed the effect of adding a theory-based strategy to enhance self-efficacy in home-based PFME for women with urinary incontinence. It was hypothesised that women who received the extra intervention to improve self-efficacy – consisting of a reminder magnet, watching a video with testimonials (vicarious experience) and discussing and registering treatment achievements and goals (performance accomplishments) – would

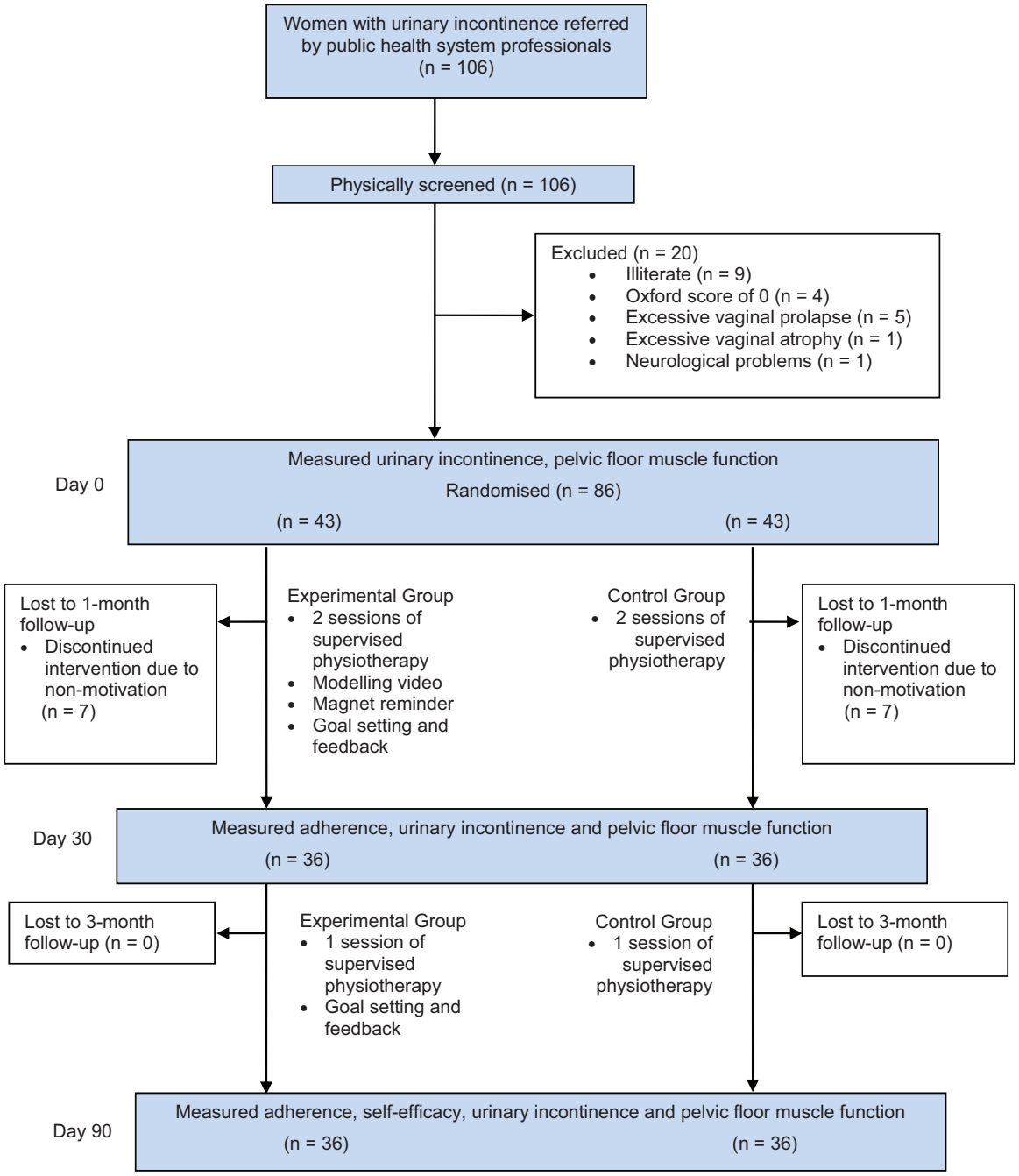

Figure 1. Design and flow of participants through the trial.

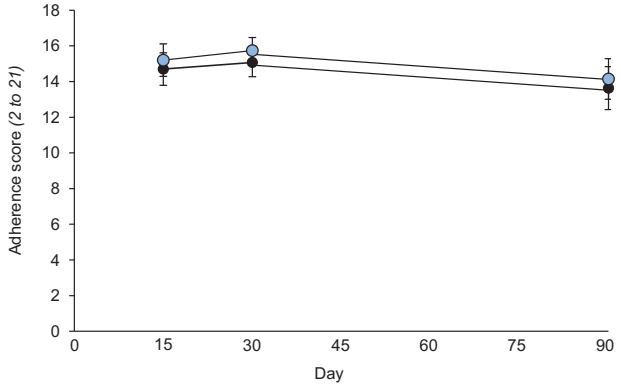

Figure 2. Mean (95% CI) adherence scores for the experimental (blue) and control (black) groups at Days 15, 30 and 90.

be more adherent to home-based PFME than women that received only the conventional physiotherapeutic approach focusing on exercise mastery. However, data showed no differences in between-group adherence outcomes, which means that the reminder and the modelling video did not make a difference.

What might have triggered this result was the lack of between-group contrast, since conventional physiotherapy for urinary incontinence already includes strategies to increase mastery experience, which is the main source of self-efficacy. Therefore, for both groups, enabling mastery experience through periodically supervising the exercises, giving constant feedback and encouraging self-instructed performance might have increased the women's self-efficacy and, consequently, adherence. It is likely that extra materials do not outweigh the intense contact and bonding between the patient and physiotherapist, or influence adherence behaviour. As this was mainly a non-supervised approach, its objective was to provide empowerment to women in order to deal with urinary incontinence and to perform home-based PFME.

Table 2
Baseline sociodemographic characteristics of participants.

Characteristic	Exp (n = 43)	Con (n = 43)
Age *(yr)*, n (%)		
20 to 40	4 (9)	7 (16)
41 to 55	23 (53)	23 (53)
56 to 74	16 (37)	13 (30)
Marital status, n (%)		
married/de facto	26 (60)	28 (65)
single	6 (14)	4 (9)
divorced	7 (16)	7 (16)
widowed	4 (9)	4 (9)
Education level, n (%)		
incomplete primary	11 (26)	15 (35)
primary	7 (16)	7(16)
incomplete secondary	4 (9)	2 (5)
secondary	9 (21)	11 (26)
university	12 (28)	8 (19)
Income/person in the family, n (%)[a]		
up to minimum wage	17 (40)	25 (61)
more than minimum wage	25 (60)	16 (39)
Ethnicity, n (%)		
Caucasian	49 (93)	40 (93)
Mulatto/Black/Indigenous	3 (7)	3 (7)
Health status, n (%)		
very good	3 (7)	3 (7)
good	17 (40)	13 (30)
moderate	21 (49)	16 (37)
bad	1 (2)	9 (21)
very bad	1 (2)	2 (5)
Smoker/passive smoker, n (%)	3 (7)	5 (12)
Physically active during leisure time, n (%)	15 (35)	19 (44)
Sexually active with a partner, n (%)	26 (60)	30 (70)

Con = control group, Exp = experimental group.
[a] Valid percentage was used due to missing values.

Table 3
Baseline clinical characteristics of participants.

	Exp (n = 43)	Con (n = 43)
Parity, n (%)		
nulliparous	4 (9)	3 (7)
primiparous	10 (23)	6 (14)
multiparous (2 to 3 deliveries)	24 (56)	21 (49)
multiparous (4 to 8 deliveries)	5 (12)	13 (30)
Body mass index, n (%)[a]		
normal	11 (26)	9 (23)
overweight	13 (30)	17 (44)
obese	19 (44)	13 (33)
Comorbidities, n (%)		
diabetes	6 (14)	2 (5)
hypertension	18 (42)	13 (30)
asthma/bronchitis	10 (23)	6 (14)
depression	11 (26)	12 (28)
frequent back pain	23 (53)	30 (70)
constipation	10 (23)	12 (28)
Menopause, n (%)	23 (53)	23 (53)
Medication use, n (%)		
hormone replacement	5 (12)	1 (2)
topical hormone in vagina	1 (2)	2 (5)
medication for urge UI	1 (2)	1 (2)
Gynaecological surgery, n (%)		
hysterectomy	5 (12)	10 (23)
perineoplasty	2 (5)	7 (16)
surgery for cystocele	5 (12)	3 (7)
oophorectomy	3 (7)	1 (2)
PFM strength *(0 to 5)*[a], n (%)		
1 - flicker	7 (16)	3 (7)
2 - weak	10 (23)	12 (28)
3 - moderate	16 (37)	16 (37)
4 - good	10 (23)	12 (28)
PFM endurance *(s)*, n (%)		
1 to 3	13 (30)	7 (16)
4 to 6	16 (37)	20 (47)
7 to 10	14 (33)	16 (37)
UI classification, n (%)		
stress	22 (51)	18 (42)
urgency	2 (5)	1 (2)
mixed	19 (44)	24 (56)
Frequency of UI, n (%)		
$\leq$ 1/wk	6 (14)	4 (9)
2 to 3/wk	7 (16)	14 (33)
1/d	8 (19)	8 (19)
$\geq$ 1/d	19 (44)	15 (35)
all the time	3 (7)	2 (5)
Amount of urine leakage, n (%)		
small[b]	15 (35)	15 (35)
moderate	21 (49)	18 (42)
large	7 (16)	10 (23)

Con = control group, Exp = experimental group, ICIQ-SF = International Consultation on Incontinence Questionnaire Short Form, PFM = pelvic floor muscle, UI = urinary incontinence.
[a] Modified Oxford Scale.
[b] Some drops.

According to Feste and Anderson,[22] there is a growing need for interventions like this that stimulate people to bring about changes in their personal behaviour and social situations.

Regarding secondary outcomes, at the Day-30 evaluation, participants in the experimental group had significantly lower scores of ICIQ-SF than those in the control group, which means that their urinary incontinence had less impact on their quality of life. However, there was no between-group difference in ICIQ-SF at baseline, Day 15 and Day 90. The transient effect noted at Day 30 was insufficient to conclude that video and reminders make a difference.

This study contributes to the few attempts that have been made to test strategies to improve PFME adherence.[8,11,12,23] Electronic reminders were found to be effective for increasing adherence to home-based PFME but not necessarily to improving urinary incontinence.[11,12] A theory-based trial that added diverse health education approaches to conventional physiotherapy did not observe differential improvements to adherence, but all of the groups showed improvements.[8]

Another trial using the four aspects of the self-efficacy theory to prevent urinary incontinence with PFME was effective in improving adherence and urinary incontinence but, as it had an explanatory design, the control group did not receive any instruction to perform PFME.[23] A study that investigated the same theory in a cardiac rehabilitation program also did not find any between-group differences regarding self-efficacy or adherence to home-based exercise.[24] One systematic review that studied adherence to musculoskeletal outpatient physiotherapy concluded that there was conflicting evidence that adherence strategies could improve short-term adherence to 3 months of home exercises.[25]

Despite there being no effectiveness on adherence promotion, it was observed that adherence to home-based PFME was high in both groups. It is possible that the treatment per se and the instruments used in this study (the self-efficacy scale and the diary

Table 4
Mean (SD) outcome data at each study visit for each group, and mean (95% CI) difference between groups.

Outcome *(range)*	Groups						Difference between groups		
	Day 15		Day 30		Day 90		Day 15	Day 30	Day 90
	Exp	Con	Exp	Con	Exp	Con	Exp minus Con	Exp minus Con	Exp minus Con
	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)			
Adherence *(2 to 21)*	15.2 (3.0)	14.7 (3.0)	15.7 (2.4)	15.1 (2.6)	14.1 (3.7)	13.6 (3.9)	0.4 (–0.9 to 1.7)	0.7 (–0.4 to 1.7)	0.5 (–1.1 to 2.1)
Self efficacy *(0 to 100)*					80 (13)	82 (12)			–3 (–8 to 3)

Exp = experimental group, Con = control group.

Table 6
Median (IQR) outcome data at each study visit for each group, and median (95% CI) difference between groups.

Outcome *(range)*	Groups						Difference between groups[a]		
	Day 15		Day 30		Day 90		Day 15	Day 30	Day 90
	Exp	Con	Exp	Con	Exp	Con	Exp minus Con	Exp minus Con	Exp minus Con
	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)			
Fast reps *(n/d)*	46 (30 to 60)	40 (30 to 44)	42 (30 to 50)	42 (25 to 50)	40 (28 to 50)	40 (20 to 50)	6 (–1 to 16)	6 (–2 to 10)	1 (–9 to 17)
Slow reps *(n/d)*	24 (15 to 30)	25 (10 to 30)	28 (15 to 30)	29 (20 to 35)	25 (13 to 30)	20 (15 to 25)	0 (–6 to 5)	–1 (–10 to 1)	5 (–5 to 10)
Exercise days/week *(0 to 7)*	7.0 (6.9 to 7.0)	7.0 (6.4 to 7.0)	7.0 (6.3 to 7.0)	7.0 (6.2 to 7.0)	7.0 (5.9 to 7.0)	6.0 (5.4 to 7.0)	0.0 (0.0 to 0.0)	0.0 (0.0 to 0.1)	0.0 (0.0 to 0.9)
Outcome expectation *(0 to 100)*					93 (88 to 98)	92 (90 to 100)			0 (–3 to 3)

Exp = experimental group, Con = control group, reps = repetitions.
[a] Calculated using Hodges-Lehman Estimation.

Table 7
Mean (SD) baseline and outcome data for each group, mean (SD) difference within groups, and mean (95% CI) difference between groups.

Outcome	Groups								Difference within groups						Difference between groups		
(range)	Day 0		Day 15		Day 30		Day 90		Day 15 minus Day 0		Day 30 minus Day 0		Day 90 minus Day 0		Day 15 minus Day 0	Day 30 minus Day 0	Day 90 minus Day 0
	Exp	Con	Exp	Con	Exp	Con	Exp	Con	Exp	Con	Exp	Con	Exp	Con	Exp minus Con	Exp minus Con	Exp minus Con
	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)	(n = 43)									
PFM endurance *(sec)*	5.1 (2.5)	5.9 (2.1)	6.0 (2.3)	7.2 (1.6)	7.1 (1.7)	7.7 (1.7)	7.8 (1.9)	8.6 (1.5)	0.9 (2.0)	1.3 (2.3)	1.9 (2.2)	1.8 (2.4)	2.7 (2.4)	2.7 (2.6)	–0.4 (–1.4 to 0.5)	0.2 (–0.8 to 1.2)	0.0 (–1.1 to 1.1)

Exp = experimental group, Con = control group, PFM = pelvic floor muscles.

Table 8
Median (IQR) baseline and outcome data for each group, median (IQR) difference within groups, and median (95% CI) difference between groups.

Outcome (*range*)	Groups: Day 0 Exp (n = 43)	Day 0 Con (n = 43)	Day 15 Exp (n = 43)	Day 15 Con (n = 43)	Day 30 Exp (n = 43)	Day 30 Con (n = 43)	Day 90 Exp (n = 43)	Day 90 Con (n = 43)	Difference within groups: Day 15 minus Day 0 Exp	Day 15 minus Day 0 Con	Day 30 minus Day 0 Exp	Day 30 minus Day 0 Con	Day 90 minus Day 0 Exp	Day 90 minus Day 0 Con	Difference between groups[a]: Day 15 minus Day 0 Exp minus Con	Day 30 minus Day 0 Exp minus Con	Day 90 minus Day 0 Exp minus Con
ICIQ-SF (*0 to 21*)	15 (12 to 17)	15 (12 to 17)	9 (8 to 11)	9 (7 to 12)	6 (4 to 7)	8 (5 to 12)	6 (0 to 8)	5 (0 to 6)	−4 (−7 to −2)	−4 (−8 to −2)	−7 (−12 to −5)	−7 (−10 to −3)	−10 (−12 to −5)	−9 (−6 to −14)	0 (−2 to 2)	−2 (−4 to 0)	−1 (−2 to 0)
PFM strength (*1 to 5*)	3.0 (2.0 to 3.0)	3.0 (2.0 to 4.0)	3.4 (3.0 to 4.0)	3.4 (3.0 to 4.0)	3.5 (3.0 to 4.0)	4.0 (3.9 to 4.0)	4.0 (3.8 to 4.0)	4.0 (4.0 to 5.0)	1.0 (0.0 to 1.0)	0.4 (0.0 to 1.0)	1.0 (0.3 to 1.0)	1.0 (0.5 to 1.9)	1.0 (1.0 to 2.0)	1.0 (1.0 to 2.0)	0.0 (0.0 to 0.6)	0.0 (−0.5 to 0.0)	0.0 (−0.2 to 0.0)

Exp = experimental group, Con = control group, ICIQ-SF = International Consultation on Incontinence Questionnaire - short form.
[a] Calculated using Hodges-Lehman Estimation.

for adherence) could have motivated adherence behaviour. Similarly, another study that added health education strategies to conventional supervised physiotherapy treatment found no additional benefit of education or reminders, for example, but that study also had high adherence rates.[8]

The adherence score was significantly lower in the last evaluation, when women went 2 months without physiotherapeutic supervision, compared with adherence at the 1-month evaluation when women had attended two physiotherapy sessions during the previous month. This finding is in agreement with systematic reviews showing that supervised programs with the support of the therapists tend to be effective in promoting adherence.[1,2,4] In addition, people tend to stop exercising when they reach their target.

This study provided information that home-based PFME, which was instructed and monitored three times in 3 months by a specialised physiotherapist, was effective for urinary incontinence management. For both groups, around 28% of the women who enrolled in the trial finished the treatment without any urinary incontinence symptoms and around 47% reported improved symptoms. Non-supervised approaches would benefit women who live far from specialised treatment centres or are too busy to attend clinics so frequently. Slack et al[26] previously suggested that before referral to medical specialists, many women should try specialised physiotherapy instruction to perform home-based pelvic floor exercises and perform PFME. Studies support the effectiveness of non-supervised PFME regimens that are taught by physiotherapists for reducing urinary incontinence symptoms.[5,6,26,27]

This study presented some limitations, such as not blinding the subjects and evaluators, and no allocation concealment. To minimise possible bias, a diary was used to record adherence and urinary incontinence outcomes. In addition, the PFME adherence measurement was based on self-report because, to date, this is the best instrument that is available with which to evaluate it. There were also some difficulties in maintaining the between-group contrast because of contamination by using the same trainer in both groups and since enhancing mastery experience is inherent to any physiotherapeutic approach. Mastery is more powerful than learning by modelling. Additionally, social desirability might have influenced some answers to the questionnaires in both groups (eg, the presence of interviewers). It is suggested that future research should continue to study self-efficacy enhancement, increasing the between-group contrast when testing behaviour-enhancing strategies from theoretical models. In the context of sociocognitive theory, a dismantling study could be conducted in which the full protocol could be compared with its constituent components (eg, video only, reminder only). Likewise, strategies to manage exercise dose-response issues should be further investigated in non-supervised approaches. On the other hand, the strengths of this trial were the use of validated questionnaires and being designed according to a theoretical perspective. Fairly successful outcomes were found in both groups.

What is already known on this topic: Pelvic floor muscle exercises are recommended in the management of all types of urinary incontinence but, to be effective, they require adherence. The effect of reminders and other strategies to increase adherence is unclear.
What this study adds: Strategies to enhance self-efficacy – such as a structured discussion on accomplishments and goals, a 9-minute video with testimonials, and a reminder – do not increase exercise adherence more than teaching women to master the pelvic floor muscle exercises.

Footnotes: [a] Perina® pressure biofeedback, Quark Medical, Piracicaba, Brazil

eAddenda: Table 5 can be found online at doi:10.1016/j.jphys.2015.08.005

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Competing interests: Nil.

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