#655 Effectiveness of Supervised Exercise and Pelvic Floor Muscle Training in Alleviating Genito-Pelvic Pain in Women with Endometriosis: A Randomized Controlled Trial

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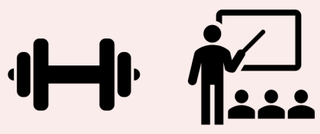
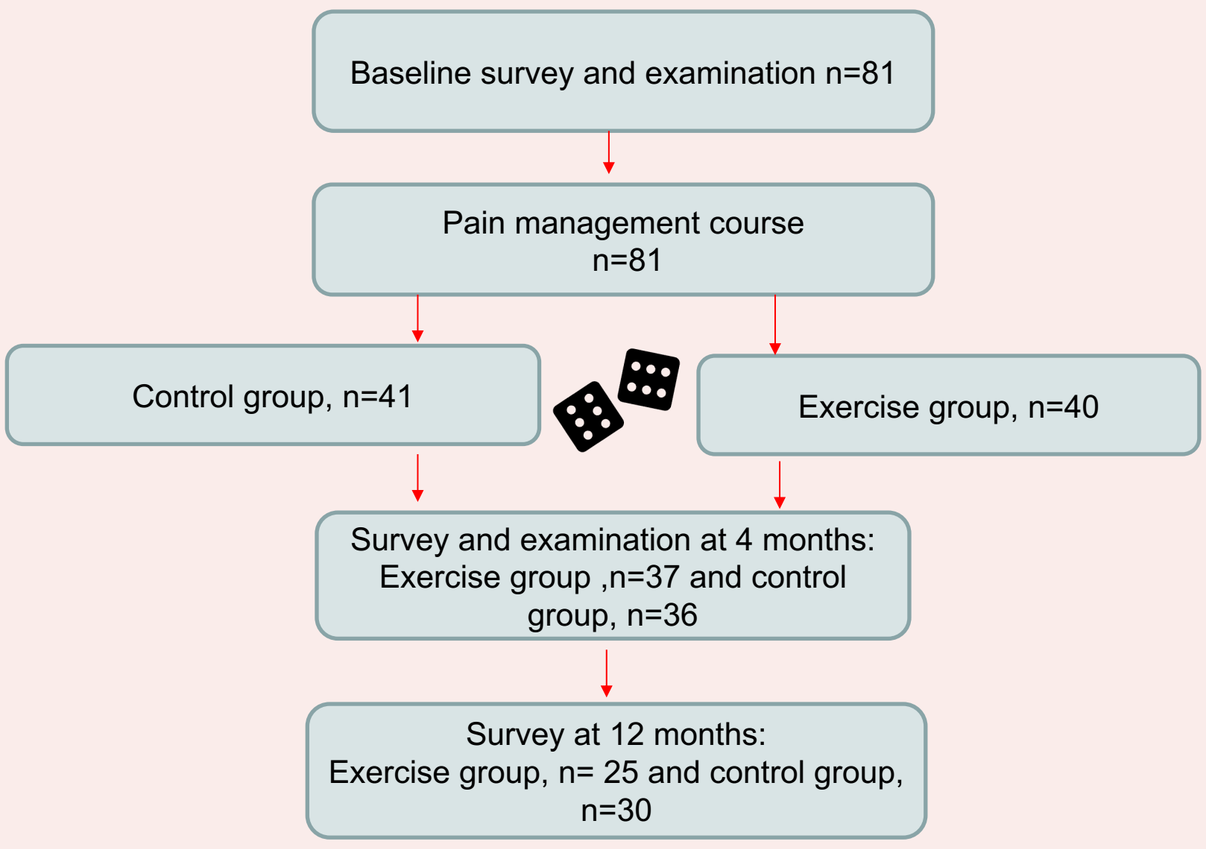
Hypothesis / aims of study

Women with endometriosis present with symptoms of genito-pelvic pain, in addition to musculoskeletal problems (1).

International clinical guidelines advocate for a multimodal treatment approach, including pain education and general exercise training, to manage endometriosis associated pain (1). However, to date, no randomized controlled trails (RCT) of high methodological quality exist.



The aim of this study was to investigate whether group-based pain education and supervised group-based general exercise training, including pelvic floor muscle trainig (PFMT), compared to pain education alone, relieves genito-pelvic pain in women with endometriosis. A secondary aim was to investigate whether an effect of PFMT was associated with a change in vaginal resting pressure (VRP), vaginal resting activity (VRA), PFM strength/maximal voluntary contractions (MVC) and PFM endurance.



Electronic questionnaire: Background data and genito-pelvic pain was assessed as pain at its worst, best, and present pain over the course of one month using the numeric rating scale (NRS) ranging from 0-10 at baseline and 4 mounts.

The pelvic floor muscle assessment included VRP, MVC and PFM Endurance using a manometer/precision pressure transducer connected to a vaginal balloon and measured in cmH2O. VRA was assessed by sEMG (NeuroTrac MyoPlus Pro), quantified as average microvolts (μV).

Inclusion criteria
- Laparoscopic-confirmed endometriosis
- 18-45
- Genito-pelvic pain
- Able to participate in an exercise group

Exclusion criteria
- Intra-abdominal/vaginal surgery/ botox <6 months
- Severe pathology
- Pregnancy/childbirth or breastfeeding <12 months
- Severe psychiatric disorders

The exercise group followed a weekly 60-minute group training for four months led by a women's health physiotherapist. The group training consisted of a standardized program that included endurance, strength training of large muscle groups, PFMT, and flexibility training (2). The PFMT included 8–10 repetitions of maximal contraction held for 6–8 seconds in 3 series. An additional individually tailored progressive home exercise program, including daily PFMT was also performed.

Intensity, number, and length of home training sessions, and any adverse effects were recorded through a training diary.

The control group received no further follow-up.

The mean difference in outcome measures between the groups was measured using t-tests. ANCOVA assessed changes from baseline to week 16 and reported as mean and 95%CI.

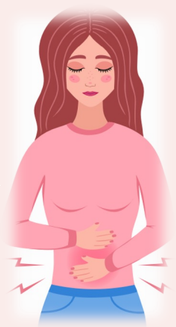
Analyses were based on intention to treat (ITT) and per protocol, including participants attending >50% of the sessions in the exercise group or following the home training program >50% of the time and PFMT twice a week or a minimum of 2 workouts per week on average.

P-values <0.05 were considered statistically significant.

Results

Mean age 29.4 (range 18-43)

Time since diagnosis: 5 years (range 2–21)



>4 years higher education: n=33 (40.2%)

Parous 9/81 (11%)

The ITT analysis revealed no change in best and worst pain within or between groups.

A significant larger reduction of genito-pelvic present pain in the exercise group compared to the control group, with a mean difference of 1.2 (95%CI 0.1–2.2) between groups was found (Table 1). Within groups it was a significant larger reduction of genito-pelvic present pain in the exercise group (Table 1).

Between groups the per-protocol analysis revealed a significant reduction in genito-pelvic pain at its worst [mean difference: 1.6, (95%CI 0.2–3)] and present [mean difference: 1.7, (95%CI 0.4– 2.9)] favoring the exercise group.

No adverse effects were reported

Table 1. Between and within group analysis of worst, best and present genito-pelvic pain scores at baseline and after the intervention. Scores were measured on a Numerated Rating Scale (NRS) from 0-10. Exc=Exercise group, Con=Control group

	Groups				Between-group difference			Within-group difference		
	Week 0 mean (SD)		Week 16 mean (SD)					mean (SD)		
NRS Pain scores	**Exc (n=40)**	**Con (n=41)**	**Exc (n=35)**	**Con (n=36)**	**Mean diff**	**95% CI**	**P-value**	**Exe (n=36)**	**Con (n=38)**	**P-value**
Genito-pelvic pain$_{worst}$	6.5 (1)	7.5 (2)	6.5 (2)	7.5 (2)	1.028	-0.7– -2	0.09	0 (0.3)	0.01 (0.34)	0.19
Genito-pelvic pain$_{best}$	2 (2)	2 (2)	1.7 (2)	2.1 (2)	0.423	-0.6–1.4	0.27	-0.3 (0.3)	0.1 (0.34)	0.85
Genito-pelvic pain$_{present}$	2.5 (2)	3.5 (2)	2.3 (2)	3.5 (2)	1.213	0.1-2.2	0.025	-0.2 (2)	0.01 (2)	0.017

No significant between-group differences in VRP, MVC, PFM muscular endurance or VRA was found(Table 2).

Table 2. Between and within analysis of vaginal resting pressure (VRP), maximum voluntary contractions (MVC) and pelvic floor muscle (PFM) endurance with manometry and surface EMG measures the vaginal resting activity (VRA) before and after the intervention. Exc=Exercise group, Con=Control group

	Groups				Between-group difference			Within-group difference	
	Week 0 Mean (SD)		Week 16 Mean (SD)					Mean (SD)	
	Exc (n=40)	**Con (n=41)**	**Exc (n=36)**	**Con (n=38)**	**Mean diff**	**95% CI**	**P-value**	**Exc**	**Con**
VRA, μV	33 (74)	14 (12)	18 (9)	17 (13)	-0.6	-6.2–5	0.8	-15 (13)	3 (8)
VRP, cm H_20	28 (16)	27 (11)	23 (12)	25 (11)	2.8	-2.8–8.5	0.3	-28 (15)	-2 (11)
MVC, cm H_20	23 (18)	24 (13)	23 (11)	21 (11)	-0.1	-5.7–5.3	0.9	0.01 (17)	-3 (11)
Endurance cm H_20	97 (95)	110 (66)	102 (54)	96 (54)	-8.4	-34–17	0.5	5 (57)	-14 (48)

Interpretation of results

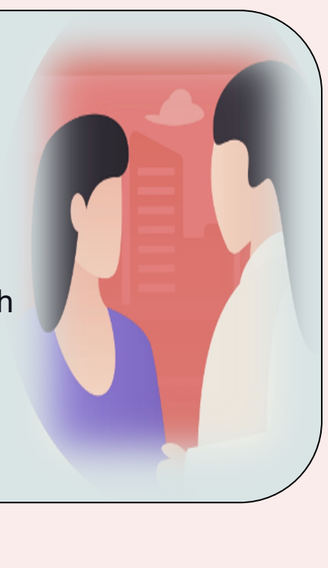
Among women with endometriosis, supervised general exercise training, including PFMT, improved genito-pelvic pain, compared to women participating in a pain education course. A per-protocol analysis revealed that the effect of exercise training was even larger among women following the prescribed exercise regimen. These results highlight the importance of supervision in achieving a preferred dosage of exercise.

The prescribed exercises may not have directly influenced PFM muscle strength in this study. However, the tendency towards lesser VRA and VRP, albeit not statistically significant, may still be relevant to the reduction in pain observed in the exercise group. It may be essential to examine whether it has affected the other outcome measure, like mastering living with endometriosis.

Concluding message

The results from this RCT indicate that supervised general exercise training, including PFMT, may improve genito-pelvic pain among women with endometriosis.

Thus, clinicians should carefully empower their patients with knowledge and skills in implementing exercise training as part of their treatment.



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1. Becker CM, Bokor A, Heikinheimo O, Horne A, Jansen F, Kiesel L, et al. ESHRE guideline: endometriosis. Hum Reprod Open. 2022.
2. Piercy, K. L., & Troiano, R. P. (2018). Physical Activity Guidelines for Americans From the US Department of Health and Human Services. *Circ Cardiovasc Qual Outcomes*, *11*(11), e005263.

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