LINK MEDICAL JOURNAL
of Health and Community Research | LMJHCR
Volume 4, Issue 1 | June 2026 | ISSN 3007-3448

Indexed in DOAJ | CC Bq4jc7c36Y 4.0
DOI: 10.61919/jvs45524

Original Article

Structured Pelvic Floor Rehabilitation for Improving Conception Outcomes in PCOS Women with Occult Pelvic Floor Dysfunction

Naheed Shah[1], Sitara Saif[2], Huma Gul[3], Maha Safder[4], Minahil Adnan[5], Shabana Khan[6], Muqaddisa Nawaz[3]

[1] Assistant Professor, Department of Zoology, University of Sindh, Jamshoro, Pakistan, https://orcid.org/0000-0003-3060-4289
[2] Consultant Gynaecologist and Obstetrician, Shaafi International Hospital, Islamabad, Pakistan
[3] Doctor of Physical Therapy, Riphah International University, Islamabad, Pakistan
[4] Doctorate of Physical Therapy, Abasyn University, Islamabad Campus, Pakistan
[5] MBBS, Rashid Latif Medical College, Lahore, Pakistan
[6] House Officer, SPH, Quetta, Pakistan

***Corresponding author: Naheed Shah, naheed.shah@usindh.edu.pk**

"Cite this Article" | **Received**: 11 February 2026; **Accepted**: 09 June 2026; **Published**: 30 June 2026.

ABSTRACT

Background: Polycystic ovary syndrome (PCOS) is a major cause of anovulatory infertility and is accompanied by metabolic, psychological, sexual, and quality-of-life disturbances. Pelvic floor dysfunction may represent an under-recognized component of reproductive and sexual health in some affected women. Objective: To evaluate whether structured pelvic floor rehabilitation improves conception and pelvic health outcomes in women with PCOS, infertility, and occult pelvic floor dysfunction. Methods: This parallel-group randomized controlled trial included 72 women allocated equally to an eight-week structured pelvic floor rehabilitation programme or standard care. Rehabilitation comprised supervised pelvic floor muscle training, biofeedback-guided exercises, manual therapy, relaxation training, breathing coordination, and a daily home-exercise programme. Follow-up data were available for 63 participants (intervention n=32; control n=31). Outcomes included conception during follow-up, pelvic floor strength assessed with the Modified Oxford Scale (MOS), sexual function assessed with the Female Sexual Function Index (FSFI), pelvic pain, and quality of life. Results: Conception occurred in 11/32 (34.4%) women in the intervention group and 4/31 (12.9%) controls, corresponding to an absolute risk difference of 21.5 percentage points (95% CI 1.2–41.7; p=0.045) and a crude risk ratio of 2.66 (95% CI 0.95–7.48). Post-intervention MOS scores were 3.4±0.7 versus 2.5±0.6 (mean difference 0.90, 95% CI 0.57–1.23; p<0.001). FSFI scores were higher in the intervention group (24.1±3.8 vs 20.2±3.6; p<0.001), while pain scores were lower (2.1±1.0 vs 3.6±1.2; p<0.001) and quality-of-life scores were higher (78.4±6.5 vs 69.2±7.1; p<0.001). Conclusion: Structured pelvic floor rehabilitation improved pelvic floor strength, sexual function, pain, and quality of life and was associated with a higher observed conception proportion during short-term follow-up. The fertility estimate was imprecise, and larger randomized trials with longer reproductive follow-up and complete randomized-participant analyses are required. Keywords: Conception, Female Sexual Function, Infertility, Pelvic Floor Dysfunction, Pelvic Floor Rehabilitation, Polycystic Ovary Syndrome, Quality of Life, Women's Health.

EDITORIAL INFORMATION

Author Contributions: Concept: NS, SS; Design: NS, HG; Data Collection: HG, MS, MA, SK, MN; Analysis: NS, SS, HG; Drafting: NS, SS, HG, MS, MA, SK, MN.
Ethical Approval: University of Sindh, Jamshoro, Pakistan
Informed Consent: Written informed consent was obtained from all participants
Conflict of Interest: The authors declare no conflict of interest; **Funding**: No external funding; **Data Availability**: Available from the corresponding author on reasonable request; **Acknowledgments**: N/A.

INTRODUCTION

Polycystic ovary syndrome (PCOS) is a heterogeneous endocrine disorder affecting women of reproductive age and is characterized by combinations of ovulatory dysfunction, hyperandrogenism, and polycystic ovarian morphology. Its clinical consequences extend beyond menstrual irregularity and include infertility, metabolic dysfunction, increased cardiometabolic risk, psychological morbidity, sexual-health concerns, and impaired quality of life. Infertility is particularly important because ovulatory dysfunction is a major reproductive manifestation of PCOS and frequently brings affected women into prolonged contact with fertility services. Contemporary international guidance therefore emphasizes individualized, multidisciplinary management that incorporates reproductive goals alongside metabolic, psychological, lifestyle, and quality-of-life considerations (1).

Although conventional infertility management in PCOS primarily targets ovulation, metabolic health, weight-related factors, and established female and male infertility determinants, increasing attention has been directed toward pelvic health. Pelvic floor dysfunction encompasses abnormalities in pelvic floor muscle strength, tone, relaxation, coordination, endurance, and functional integration and may manifest through urinary, bowel, sexual, pain, and support-related symptoms. A narrative synthesis specifically examining PCOS and pelvic floor dysfunction proposed that hormonal changes, obesity, metabolic abnormalities, diabetes, reproductive history, and other PCOS-associated factors may interact with pelvic floor structure and function, while emphasizing that the evidence remains incomplete (2). More recent case-control evidence reported a higher prevalence of pelvic floor dysfunction among women with PCOS than among women without the syndrome, providing additional support for the possibility that pelvic floor health may constitute a clinically relevant but under-assessed dimension of PCOS care (3).

Sexual health represents another important interface between PCOS, infertility, and pelvic floor function. A 2024 systematic review and meta-analysis found that women with PCOS had poorer sexual function across several FSFI domains, including arousal, lubrication, orgasm, pain, satisfaction, and overall sexual function, although substantial between-study heterogeneity and generally low certainty of evidence were noted (4). A subsequent systematic review and meta-analysis incorporating a broader contemporary evidence base similarly reported lower FSFI scores across multiple domains among women with PCOS, reinforcing the clinical relevance of sexual-function assessment in this population (5). The effect of PCOS on sexual health is unlikely to arise from a single pathway; infertility, obesity, hyperandrogenic manifestations, body-image concerns, emotional distress, relationship factors, pain, and metabolic comorbidity may contribute simultaneously. A systematic review of the psychosocial burden of PCOS also demonstrated substantial impairment across quality-of-life domains and reported improvement in several psychosocial measures following therapeutic interventions (6). Psychological health is particularly relevant because meta-analytic evidence demonstrates a substantially increased burden of depressive symptoms among women with PCOS compared with women without the condition (7).

Pelvic floor function may contribute to several of these symptom domains. A systematic review and meta-analysis investigating pelvic floor muscles in female sexual function reported a moderate positive association between pelvic floor muscle strength and sexual function and found evidence that pelvic floor musculature participates in arousal and orgasmic response (8). Pelvic floor rehabilitation has therefore been increasingly examined for female sexual dysfunction. A 2024 systematic review and meta-analysis concluded that pelvic floor muscle training can improve sexual-function outcomes, although treatment effects vary across populations and intervention characteristics (9). Randomized evidence from women with other pelvic floor disorders has also shown that pelvic floor muscle training can improve sexual function alongside pelvic floor muscle strength, supporting the concept that neuromuscular rehabilitation may influence sexual health through direct functional pathways (10). In women presenting with urogenital or pelvic pain, pelvic floor physical therapy is additionally recognized as a low-risk component of multidisciplinary management, with evidence supporting improvements in pain and function in selected clinical populations (11).

The relationship between physiotherapy and fertility itself is substantially less established. A 2024 study examining physiotherapy in women with PCOS undergoing infertility treatment reported improvements in patient experience, well-being, anxiety related to infertility treatment, and body awareness, but did not provide definitive randomized evidence that pelvic floor rehabilitation independently increases conception probability (12). More broadly, exercise and physical activity are important components of PCOS management. A systematic review of randomized trials found that physical activity may improve several reproductive and hormonal outcomes among women with PCOS, although protocols and measured outcomes varied considerably between studies (13). A large 2024 network meta-analysis of randomized trials in reproductive-aged women with overweight or obesity, including PCOS-specific sensitivity analyses, further demonstrated that combinations of exercise, diet, and pharmacological management can improve weight-related and ovulatory outcomes, supporting a multimodal approach to fertility care rather than reliance on any isolated non-pharmacological intervention (14).

These findings create a clinically important distinction. Pelvic floor rehabilitation has a plausible and increasingly evidence-supported role in improving pelvic floor function, sexual health, pain, and related quality-of-life outcomes, whereas its direct effect on conception in women with PCOS remains uncertain. Establishing whether a targeted pelvic rehabilitation programme can improve these pelvic outcomes and whether such improvement is accompanied by a difference in conception during follow-up could broaden understanding of supportive multidisciplinary care for women whose infertility coexists with pelvic floor dysfunction.

The present randomized controlled trial therefore evaluated an eight-week structured pelvic floor rehabilitation programme compared with standard care among women with PCOS, infertility, and clinically identified occult pelvic floor dysfunction. The primary outcomes were conception during post-intervention follow-up and pelvic floor muscle function, while secondary outcomes included sexual function, pelvic pain, and quality of life. It was hypothesized that structured pelvic floor rehabilitation would improve pelvic floor function and associated patient-reported outcomes and would be accompanied by a higher observed proportion of conception during follow-up.

MATERIALS AND METHODS

A parallel-group randomized controlled trial was conducted in the Islamabad–Rawalpindi region among women with PCOS, infertility, and clinically identified occult pelvic floor dysfunction. Recruitment was undertaken over one month, followed by an eight-week intervention period and a further four-week follow-up during which conception outcomes were recorded. Women of reproductive age diagnosed with PCOS according to the Rotterdam-based diagnostic framework used in contemporary international evidence-based guidance were screened for eligibility (1). Participants were required to have experienced infertility for at least one year and to demonstrate occult pelvic floor dysfunction on clinical pelvic floor assessment. Women with known structural pelvic pathology, previous pelvic surgery, overt pelvic floor disorders, hormonal therapy during the preceding three months, or significant systemic illness were excluded.

A total sample of 72 participants was planned on the basis of effect sizes described in previous interventional literature addressing physiotherapy, reproductive health, and pelvic health. Eligible participants were randomly allocated in a 1:1 ratio to the intervention or control group using a computer-generated random sequence. Allocation concealment was maintained using sequentially numbered, sealed opaque envelopes prepared by an independent researcher. Because of the nature of the rehabilitation programme, participants could not be blinded to treatment allocation; however, outcome assessors were blinded to group allocation to reduce detection bias.

Participants in the intervention group received structured pelvic floor rehabilitation three times weekly for eight weeks. Each supervised session lasted approximately 45 minutes and incorporated pelvic floor muscle training, biofeedback-guided exercises, manual therapy directed toward myofascial restrictions, relaxation training, and breathing-coordination exercises. Participants were additionally provided with a standardized home-exercise programme for daily performance. Participants in the control group received standard care consisting of lifestyle advice, general physical-activity recommendations, and routine fertility counselling without a targeted pelvic floor rehabilitation programme.

The principal outcomes were conception during the four-week post-intervention follow-up and pelvic floor muscle function. Pelvic floor muscle strength was assessed by digital examination using the Modified Oxford Scale (MOS), an established clinical grading approach for assessing voluntary pelvic floor contraction (15). Surface electromyography was additionally identified within the pelvic floor assessment framework. Sexual function was assessed with the Female Sexual Function Index (FSFI), a validated multidimensional self-report instrument measuring desire, arousal, lubrication, orgasm, satisfaction, and pain domains of female sexual function (16). Pelvic pain was evaluated using a visual analogue scale (VAS), while quality of life was assessed using a validated reproductive-health questionnaire. Pelvic floor strength, sexual function, pain, and quality-of-life outcomes were evaluated at baseline and immediately after the eight-week intervention. Conception status was recorded during the subsequent four-week follow-up period.

Adherence to the intervention was monitored using supervised-session attendance records and self-reported compliance with the prescribed home-exercise programme. Of the 72 randomized participants, post-intervention and follow-up outcome data were available for 63 women; consequently, post-intervention and conception comparisons were based on the 32 intervention and 31 control participants with available outcome measurements.

Continuous variables were summarized as mean ± standard deviation and categorical variables as frequency and percentage. Distributional normality was evaluated using the Shapiro–Wilk test. Baseline continuous characteristics were compared between groups using independent-samples t-tests. Within-group pre–post changes were assessed using paired t-tests where applicable, while post-intervention between-group comparisons were evaluated using independent-samples t-tests. Repeated-measures analysis of variance was used to examine the interaction between time and treatment group for pelvic floor strength. Conception proportions were compared using Pearson's χ^2 test. The conception contrast was additionally expressed as a crude risk ratio and absolute risk difference with 95% confidence intervals. Between-group mean differences and 95% confidence intervals for continuous post-intervention outcomes were calculated from the reported group means, standard deviations, and available group sizes. Statistical significance was defined as $p<0.05$.

RESULTS

A total of 96 women were screened during the recruitment phase, of whom 72 fulfilled the eligibility criteria and were randomized equally to the intervention and control groups, with 36 participants allocated to each group. During the intervention and follow-up period, four participants from the intervention group and five from the control group were lost to follow-up because of non-compliance or relocation. Follow-up outcome data were therefore available for 63 participants, comprising 32 women in the intervention group and 31 in the control group. Baseline demographic and clinical characteristics were similar between groups. Mean age was 27.6±3.4 years in the intervention group and 28.0±3.8 years in the control group (p=0.64). Mean BMI was 29.0±4.3 kg/m^2 and 29.4±3.9 kg/m^2, respectively (p=0.71). Mean duration of infertility was 2.7±1.1 years in the intervention group and 2.9±1.3 years in controls (p=0.52). Baseline pelvic floor strength was also comparable, with mean MOS values of 2.2±0.5 and 2.1±0.6, respectively (p=0.48).

Table 1. Baseline Demographic and Clinical Characteristics of Randomized Participants (N=72)

Variable	Total (N=72)	Intervention (n=36)	Control (n=36)	p-value
Age, years	27.8 ± 3.6	27.6 ± 3.4	28.0 ± 3.8	0.64
BMI, kg/m^2	29.2 ± 4.1	29.0 ± 4.3	29.4 ± 3.9	0.71
Duration of infertility, years	2.8 ± 1.2	2.7 ± 1.1	2.9 ± 1.3	0.52
Married, n (%)	72 (100)	36 (100)	36 (100)	—
Pelvic floor strength, MOS	2.1 ± 0.6	2.2 ± 0.5	2.1 ± 0.6	0.48

Data are mean ± SD unless otherwise indicated. BMI, body mass index; MOS, Modified Oxford Scale.

During the four-week follow-up period, conception was recorded in 11 of 32 women in the intervention group (34.4%) and 4 of 31 women in the control group (12.9%). Based on the participants with available follow-up data, the absolute difference in conception proportions was 21.5 percentage points (95% CI 1.2–41.7). The crude risk ratio was 2.66 (95% CI 0.95–7.48), and Pearson's χ^2 comparison yielded p=0.045. The point estimate favoured the intervention group, but the confidence interval for the relative effect was wide. Post-intervention pelvic floor strength was higher in the intervention group than in controls. Mean MOS scores were 3.4±0.7 and 2.5±0.6, respectively, producing a between-group mean difference of 0.90 points (95% CI 0.57–1.23; p<0.001). Repeated-measures analysis also demonstrated a significant time × group interaction for pelvic floor strength (F=18.72, p<0.001), indicating a greater change over time in the intervention group.

Table 2. Primary Outcomes at Post-Intervention and Follow-up

Outcome	Intervention (n=32)	Control (n=31)	Effect Estimate (95% CI)	p-value
Conception, n (%)	11 (34.4)	4 (12.9)	RR 2.66 (0.95–7.48)	0.045
Absolute conception-rate difference	—	—	21.5 percentage points (1.2–41.7)	—
Pelvic floor strength, MOS	3.4 ± 0.7	2.5 ± 0.6	MD 0.90 (0.57–1.23)	<0.001

Continuous data are mean ± SD. CI, confidence interval; MD, mean difference; MOS, Modified Oxford Scale; RR, risk ratio.

Within the intervention group, mean MOS increased from 2.2±0.5 at baseline to 3.4±0.7 after treatment, corresponding to a mean increase of 1.2 points (p<0.001). In the control group, mean MOS increased from 2.1±0.6 to 2.5±0.6, representing a mean increase of 0.4 points that was not statistically significant (p=0.08). The difference in the pattern of change was supported by the significant time × group interaction described above. Sexual function demonstrated a similar between-group pattern. Mean FSFI increased from 18.5±3.2 to 24.1±3.8 in the intervention group, corresponding to a mean change of 5.6 points (p<0.001). In the control group, mean FSFI increased from 18.9±3.5 to 20.2±3.6, a mean change of 1.3 points that did not reach statistical significance (p=0.09). At post-intervention assessment, mean FSFI was 3.90 points higher in the intervention group than in controls (95% CI 2.04–5.76; p<0.001).

Table 3. Pre–Post Changes in Pelvic Floor Strength and Sexual Function

Outcome	Group	Baseline	Post-intervention	Mean Change	Within-group p-value
MOS	Intervention	2.2 ± 0.5	3.4 ± 0.7	+1.2	<0.001
MOS	Control	2.1 ± 0.6	2.5 ± 0.6	+0.4	0.08
FSFI	Intervention	18.5 ± 3.2	24.1 ± 3.8	+5.6	<0.001
FSFI	Control	18.9 ± 3.5	20.2 ± 3.6	+1.3	0.09

Data are mean ± SD. FSFI, Female Sexual Function Index; MOS, Modified Oxford Scale.

Post-intervention pain scores were lower in the intervention group than in controls. Mean VAS pain score was 2.1±1.0 in the intervention group and 3.6±1.2 in the control group, producing a between-group mean difference of −1.50 points (95% CI −2.06 to −0.94; p<0.001). Quality-of-life scores were correspondingly higher after treatment, with means of 78.4±6.5 in the intervention group and 69.2±7.1 in the control group. The between-group mean difference was 9.20 points (95% CI 5.77–12.63; p<0.001).

Table 4. Post-Intervention Secondary Outcomes

Outcome	Intervention (n=32)	Control (n=31)	Mean Difference (95% CI)	p-value
FSFI score	24.1 ± 3.8	20.2 ± 3.6	3.90 (2.04–5.76)	<0.001
VAS pain score	2.1 ± 1.0	3.6 ± 1.2	−1.50 (−2.06 to −0.94)	<0.001
Quality-of-life score	78.4 ± 6.5	69.2 ± 7.1	9.20 (5.77–12.63)	<0.001

Data are mean ± SD. CI, confidence interval; FSFI, Female Sexual Function Index; VAS, visual analogue scale.

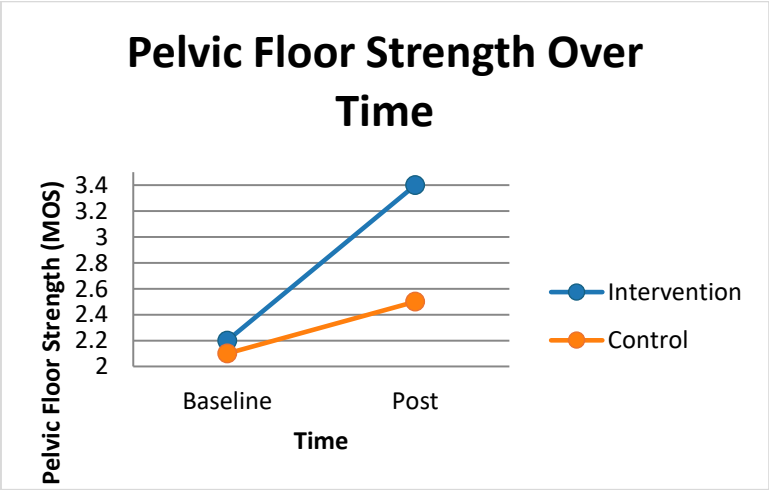

Figure 1 pelvic floor strength over time

DISCUSSION

The present randomized controlled trial examined an under-investigated component of infertility care in women with PCOS by evaluating an eight-week structured pelvic floor rehabilitation programme in participants who also demonstrated occult pelvic floor dysfunction. Women receiving rehabilitation showed greater improvement in pelvic floor muscle strength and sexual function, lower pelvic pain, and

higher quality-of-life scores than women receiving standard care. A greater proportion of women in the intervention group also conceived during the four-week follow-up period. Nevertheless, the fertility result requires substantially greater caution than the pelvic-health outcomes because only 15 conception events occurred, the analysis was based on participants with available follow-up data rather than all randomized participants, and the confidence interval surrounding the relative effect was wide.

The improvement in pelvic floor strength is consistent with the direct therapeutic target of the intervention. Pelvic floor dysfunction has increasingly been discussed in relation to PCOS, although existing evidence suggests a heterogeneous rather than uniform pattern of abnormality. Hormonal characteristics, metabolic abnormalities, obesity, reproductive history, connective-tissue factors, and altered neuromuscular function have all been proposed as potential contributors, but their relative roles remain uncertain (2). The case-control findings reported by Omar et al. further suggest that clinically detectable pelvic floor dysfunction may occur more frequently among women with PCOS than among women without the syndrome (3). These observations support greater attention to pelvic floor assessment in symptomatic or clinically selected women with PCOS, but they do not demonstrate that PCOS itself directly causes pelvic floor dysfunction.

The magnitude of change in MOS observed in the intervention group is also compatible with an active programme incorporating repeated supervised pelvic floor muscle training rather than general lifestyle advice alone. Pelvic floor muscle function is responsive to repeated neuromuscular training, but digital assessment using the MOS should be interpreted within the known limitations of clinical palpation. Reliability studies demonstrate that the scale is clinically useful while also showing variability between examiners, particularly when small grade differences are considered (15). Assessor blinding in the present trial reduces, but does not completely eliminate, concerns related to measurement subjectivity.

The improvement in sexual function is an important finding because sexual-health impairment is increasingly recognized as part of the broader burden of PCOS. Pastoor et al. demonstrated lower pooled sexual-function scores among women with PCOS across several domains, including arousal, lubrication, orgasm, satisfaction, and pain, while also emphasizing substantial heterogeneity and generally low certainty of evidence (4). A more recent meta-analysis by Bachega et al. similarly identified poorer FSFI performance across multiple domains in women with PCOS compared with controls (5). These converging findings suggest that sexual difficulties in PCOS are clinically relevant even though their expression varies substantially between individuals.

The pathways linking PCOS to sexual function are likely multifactorial. Reproductive difficulties, obesity, hyperandrogenic symptoms, body-image concerns, psychological distress, infertility-related stress, relationship dynamics, pain, and pelvic floor abnormalities can overlap and reinforce one another. A systematic review of the psychosocial effects of PCOS demonstrated substantial quality-of-life impairment across multiple domains and showed that treatment may improve several aspects of psychosocial burden (6). Meta-analytic evidence also indicates that depressive symptoms are considerably more frequent among women with PCOS than among unaffected women (7). Sexual-function improvement following pelvic rehabilitation should therefore not be interpreted as evidence that pelvic floor dysfunction is the sole explanation for sexual difficulties in PCOS; rather, it represents one potentially modifiable element within a multidimensional clinical problem.

The observed FSFI improvement is nevertheless biologically plausible in the context of existing pelvic floor research. Faucher et al. reported a moderate positive association between pelvic floor muscle strength and sexual function and identified involvement of the pelvic floor musculature in arousal and orgasmic response (8). Homsi Jorge et al. similarly concluded in a systematic review and meta-analysis that pelvic floor muscle training can improve female sexual-function outcomes, although considerable clinical and methodological variation exists across the contributing studies (9). Randomized evidence from women with overactive bladder has also demonstrated that pelvic floor muscle training can improve pelvic floor strength and sexual-function outcomes, supporting the wider principle that targeted neuromuscular training may influence sexual health (10).

The multimodal nature of the intervention may be relevant to these outcomes. The programme incorporated pelvic floor muscle training, biofeedback-guided exercises, manual therapy, relaxation training, breathing coordination, and home exercises rather than relying exclusively on strengthening. This distinction is clinically relevant because pelvic floor dysfunction may involve weakness, impaired recruitment, excessive resting activity, poor relaxation, painful myofascial dysfunction, or combinations of these features. Rehabilitation strategies therefore frequently incorporate motor retraining and relaxation as well as strengthening. Contemporary clinical literature supports pelvic floor physical therapy as part of multidisciplinary management for selected female urogenital pain conditions, particularly where musculoskeletal or myofascial contributors are present (11).

Biofeedback may have supported motor awareness and training adherence in the current intervention, although the study was not designed to isolate the effect of biofeedback from the other programme components. A 2025 Cochrane review evaluating pelvic floor muscle training with feedback or biofeedback in women with urinary incontinence concluded that adding biofeedback produces little or no difference in some clinical outcomes compared with pelvic floor muscle training alone, although treatment satisfaction may be greater and certainty varies across outcomes (17). This evidence cautions against attributing the present effects specifically to biofeedback; the observed changes more appropriately reflect the combined rehabilitation package.

The lower pain scores observed after treatment are likewise compatible with the inclusion of relaxation, manual therapy, breathing coordination, and pelvic floor retraining. Randomized clinical evidence in women with pelvic floor myofascial pain has demonstrated that interventions directed toward pelvic floor tissue and function can improve sexual-function outcomes (18). Manual therapy has also been evaluated in women with endometriosis-associated pelvic pain, where randomized evidence demonstrated reductions in pain and improvements in physical quality-of-life domains following an eight-week intervention (19). These populations differ from women with PCOS, and their findings cannot be directly generalized to the present sample, but they strengthen the broader clinical rationale for musculoskeletal and pelvic floor rehabilitation when pelvic pain coexists with gynecological conditions.

Pain reduction may have contributed to the improvement in sexual function by reducing discomfort associated with pelvic activity or intercourse, but this mechanism was not formally tested. Similarly, improved pelvic floor control could theoretically influence confidence, body awareness, and sexual experience. Because mediation analysis was not performed, it remains unclear whether improvement in FSFI occurred primarily through changes in pain, pelvic floor strength, psychosocial well-being, or a combination of these factors. Future mechanistic trials should therefore assess whether changes in pain and pelvic floor function statistically mediate sexual-function outcomes.

Quality of life also improved significantly in the intervention group. This finding is clinically important because PCOS affects substantially more than reproductive function, and international guidance emphasizes psychological well-being and health-related quality of life as core dimensions of comprehensive care (1). The psychosocial burden identified in systematic reviews includes infertility-related distress, concerns about body image and appearance, sexual difficulties, menstrual symptoms, metabolic concerns, anxiety, and depression (6,7). Recent evidence from low- and middle-income countries further suggests a high prevalence of depression and anxiety among women with PCOS, emphasizing the relevance of psychosocial assessment in settings where fertility and reproductive expectations may carry additional social significance (20).

The improvement in quality of life observed here may therefore reflect several simultaneous changes. Reduced pain, better pelvic floor control, improved sexual function, greater confidence in self-management, structured therapeutic contact, and participation in supervised exercise may each contribute. However, because the intervention was multimodal and no mediation or component analysis was conducted, the independent contribution of each mechanism cannot be determined. The quality-of-life finding should consequently be interpreted as an overall patient-reported benefit of the rehabilitation programme rather than evidence that any single treatment element was responsible.

The conception finding represents the most clinically provocative but also the most uncertain result. Conception occurred in 34.4% of women with available follow-up in the intervention group compared with 12.9% of controls, producing an absolute difference of 21.5 percentage points. Although the Pearson χ^2 comparison reached conventional statistical significance, the risk ratio of 2.66 had a wide 95% confidence interval of 0.95–7.48. The relative estimate therefore remains compatible with considerable uncertainty. The small number of conception events, short follow-up interval, and exclusion of participants without follow-up data substantially limit the precision and robustness of this finding.

Existing physiotherapy evidence in PCOS infertility does not yet provide strong confirmation of a direct fertility-enhancing effect. Szafarowska et al. reported favourable patient-centred effects of physiotherapy among women undergoing infertility treatment for PCOS, including better well-being, reduced anxiety, and greater body awareness, but the study did not establish a definitive causal effect of pelvic floor treatment on conception (12). The current trial therefore contributes a potentially important signal but should not be interpreted as establishing pelvic floor rehabilitation as a fertility treatment in its own right.

The broader exercise literature reinforces the need for this distinction. Physical activity and structured exercise can improve several metabolic and reproductive parameters in PCOS, and systematic-review evidence suggests benefits for menstrual, hormonal, and general health outcomes (13). However, these interventions influence reproductive health through pathways such as weight regulation, insulin sensitivity, cardiometabolic fitness, and ovulatory function that differ from the specific pelvic floor mechanisms targeted in the present study. Similarly, the large network meta-analysis by Ruiz-González et al. found that combinations of exercise, diet, and pharmacological interventions can improve ovulation and related reproductive outcomes, particularly among women with overweight or obesity (14). These findings support comprehensive fertility care but do not imply that all forms of physical therapy have equivalent reproductive effects.

Several theoretical pathways could nevertheless explain why better pelvic health might accompany a higher conception proportion. Reduced pelvic pain and improved sexual function could facilitate intercourse among women whose symptoms previously interfered with sexual activity. Improved neuromuscular coordination may also enhance general pelvic function. These are clinically plausible pathways supported indirectly by sexual-function and pelvic-floor evidence (8–11). By contrast, stronger mechanistic claims involving altered uterine positioning, enhanced reproductive-organ blood flow, implantation, or endocrine regulation were not directly measured in the present study and should not be inferred from the findings.

The study has several methodological strengths. Random allocation and allocation concealment using sequentially numbered sealed opaque envelopes reduced selection bias. Outcome assessors were blinded to allocation, which was particularly important for clinician-assessed pelvic floor strength. The intervention was delivered over eight weeks and included supervised and home components, allowing evaluation of a structured therapeutic programme rather than a single-session exposure. The trial additionally incorporated both clinical outcomes and patient-reported outcomes, thereby capturing pelvic floor strength, sexual function, pain, quality of life, and conception within the same clinical population.

Use of the FSFI also strengthens measurement of sexual function because it is a well-established multidimensional instrument with demonstrated reliability and validity across key domains of female sexual response (16). The MOS provides a practical clinical measure of voluntary pelvic floor contraction, although its examiner-dependent characteristics should be considered (15). Incorporation of several outcome domains is particularly valuable because a rehabilitation intervention could be clinically beneficial for pelvic and sexual health even if its effect on fertility ultimately proves smaller than suggested by the preliminary conception estimate.

Important limitations remain. Nine of the 72 randomized participants did not contribute follow-up data, meaning that the reported post-intervention and conception analyses were based on available cases rather than a complete intention-to-treat population. Differential attrition was numerically small but may still influence a modest trial. Larger trials should prespecify missing-data procedures and include

sensitivity analyses evaluating the effect of alternative assumptions regarding participants lost to follow-up.

The relatively short follow-up is another major limitation. Conception was assessed during only four weeks following completion of the intervention. Fertility studies frequently require longer observation because opportunities for conception depend on ovulatory timing, intercourse exposure, concurrent treatment, and biological variability across cycles. Future trials should therefore incorporate longer reproductive follow-up and clinically stronger endpoints such as biochemical pregnancy, ultrasound-confirmed clinical pregnancy, ongoing pregnancy, miscarriage, and live birth.

Potential reproductive confounding also remains important. Fertility in women with PCOS can be influenced by ovulatory status, BMI, insulin resistance, tubal patency, endometriosis, ovarian reserve, semen parameters, intercourse frequency, pharmacological ovulation induction, and assisted reproductive treatment (1,14). These factors were not incorporated into an adjusted conception model in the available analysis. Consequently, the observed conception difference cannot be attributed exclusively to pelvic floor rehabilitation, even though random allocation should reduce systematic imbalance in measured and unmeasured characteristics within sufficiently large samples.

The study was conducted within a specific regional healthcare context and used a relatively modest sample, limiting external generalizability. Participant blinding was not feasible because women necessarily knew whether they were receiving supervised pelvic rehabilitation, creating potential expectation or performance effects. Adherence was monitored through attendance records and self-reported home-exercise compliance, but individual variation in actual home performance could have influenced the magnitude of response.

Another limitation is that surface electromyography was identified within the pelvic floor assessment framework but corresponding longitudinal results were not available in the outcome dataset used for the present analysis. Objective physiological assessment could complement digital muscle grading in future trials and help distinguish changes in voluntary strength from changes in resting activity, coordination, or recruitment. Likewise, hormonal and metabolic measurements after intervention could help determine whether treatment effects remain confined to pelvic and patient-reported domains or coexist with broader physiological changes.

Future research should therefore build upon the present findings using multicentre randomized trials with larger samples, complete randomized-participant analyses, prespecified fertility endpoints, standardized documentation of concurrent infertility treatments, and longer reproductive follow-up. Intervention protocols should report exercise dosage, progression, biofeedback parameters, manual techniques, adherence, and therapist training in sufficient detail to permit replication. Mechanistic studies could additionally examine whether changes in pelvic floor strength, pain, sexual function, intercourse frequency, psychological well-being, or other variables mediate any observed association with conception.

Overall, the strongest evidence generated by the present trial concerns pelvic floor strength, sexual function, pain, and quality of life. These outcomes changed consistently in favour of structured rehabilitation and are supported by a broader literature demonstrating meaningful relationships among pelvic floor function, sexual health, pain, and patient-centred outcomes (8–11,17–19). The higher observed conception proportion is clinically interesting and warrants further investigation, but its statistical imprecision and methodological limitations prevent it from being considered definitive evidence of improved fertility.

CONCLUSION

Structured pelvic floor rehabilitation produced greater improvements in pelvic floor strength, sexual function, pain, and quality of life than standard care among women with PCOS, infertility, and occult pelvic floor dysfunction. A higher proportion of women receiving rehabilitation conceived during short-term follow-up; however, the small number of conception events, wide relative-effect confidence interval, available-case analysis, and brief reproductive follow-up limit certainty regarding fertility efficacy. Pelvic

floor rehabilitation may therefore represent a useful adjunct for pelvic and sexual health in appropriately selected women with PCOS, while any effect on conception requires confirmation through adequately powered multicentre randomized trials using complete randomized-participant analyses, standardized concurrent fertility management, and longer-term reproductive outcomes.

REFERENCES

1. Teede HJ, Tay CT, Laven JJE, Dokras A, Moran LJ, Piltonen TT, et al. Recommendations from the 2023 International Evidence-based Guideline for the Assessment and Management of Polycystic Ovary Syndrome. Hum Reprod. 2023;38(9):1655–1679. doi:10.1093/humrep/dead156.
2. Saei Ghare Naz M, Ramezani Tehrani F, Behroozi-Lak T, Mohammadzadeh F, Kholosi Badr F, Ozgoli G. Polycystic ovary syndrome and pelvic floor dysfunction: a narrative review. Res Rep Urol. 2020;12:179–185. doi:10.2147/RRU.S249611.
3. Omar MG, Yousef AM, Kamel HEH, Yosri MM. Prevalence of pelvic floor dysfunction among women with polycystic ovarian syndrome: a case-control study. Bull Fac Phys Ther. 2023;28:9. doi:10.1186/s43161-023-00120-3.
4. Pastoor H, Mousa A, Bolt H, Bramer W, Burgert TS, Dokras A, et al. Sexual function in women with polycystic ovary syndrome: a systematic review and meta-analysis. Hum Reprod Update. 2024;30(3):323–340. doi:10.1093/humupd/dmad034.
5. Bachega FS, Turri JA, Baracat MC, Simões R, Maciel GAR, Lobo RA, et al. New comprehension on polycystic ovary syndrome and sexual function: a systematic review and meta-analysis. J Sex Med. 2025. doi:10.1093/jsxmed/qdaf163.
6. Rempert AN, Sarria I, Standeven L, Nylander E, Segars J, Singh B. A systematic review of the psychosocial impact of polycystic ovarian syndrome before and after treatment. Reprod Sci. 2023. doi:10.1007/s43032-023-01285-x.
7. Dybciak P, Raczkiewicz D, Humeniuk E, Powrózek T, Gujski M, Małecka-Massalska T, et al. Depression in polycystic ovary syndrome: a systematic review and meta-analysis. J Clin Med. 2023;12(20):6446. doi:10.3390/jcm12206446.
8. Faucher S, Déry-Rouleau G, Bardin M, Morin M. Investigating the role of the pelvic floor muscles in sexual function and sexual response: a systematic review and meta-analysis. J Sex Med. 2024;21(3):217–239. doi:10.1093/jsxmed/qdad175.
9. Homsi Jorge C, Bø K, Catai CC, Brito LG, Driusso P, Tennfjord M. Pelvic floor muscle training as treatment for female sexual dysfunction: a systematic review and meta-analysis. Am J Obstet Gynecol. 2024;231(1):51–66.e1. doi:10.1016/j.ajog.2024.01.001.
10. Celenay ST, Karaaslan Y, Ozdemir E. Effects of pelvic floor muscle training on sexual dysfunction, sexual satisfaction of partners, urinary symptoms, and pelvic floor muscle strength in women with overactive bladder: a randomized controlled study. J Sex Med. 2022. doi:10.1016/j.jsxm.2022.07.003.
11. Tracey A. Pelvic floor physical therapy and its merit in the treatment of female urogenital pain. Curr Pain Headache Rep. 2022. doi:10.1007/s11916-022-01076-0.
12. Szafarowska M, Rosiński M, Segiet-Święcicka A, Jędrzejczyk S, Jerzak M, Jerzak MJ. Effect of physiotherapy on infertility treatment in polycystic ovary syndrome patients. Prz Menopauzalny. 2024;23(1):14–20. doi:10.5114/pm.2024.136439.
13. Butt MS, Saleem J, Zakar R, Aiman S, Khan M, Fischer F. Benefits of physical activity on reproductive health functions among polycystic ovarian syndrome women: a systematic review. BMC Public Health. 2023. doi:10.1186/s12889-023-15730-8.
14. Ruiz-González D, Cavero-Redondo I, Hernández-Martínez A, Baena-Raya A, Martínez-Forte S, Altmäe S, et al. Comparative efficacy of exercise, diet and/or pharmacological interventions on BMI, ovulation, and hormonal profile in reproductive-aged women with overweight or obesity: a systematic review and network meta-analysis. Hum Reprod Update. 2024. doi:10.1093/humupd/dmae008.
15. Ferreira CHJ, Barbosa PB, Souza FO, Antônio FI, Franco MM, Bø K. Inter-rater reliability study of the modified Oxford Grading Scale and the Peritron manometer. Physiotherapy. 2011;97(2):132–138. doi:10.1016/j.physio.2010.06.007.

16. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, et al. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. J Sex Marital Ther. 2000;26(2):191–208. doi:10.1080/009262300278597.
17. Fernandes ACC, Jorge CH, Weatherall M, Ribeiro IV, Wallace SA, Hay-Smith EJ. Pelvic floor muscle training with feedback or biofeedback for urinary incontinence in women. Cochrane Database Syst Rev. 2025. doi:10.1002/14651858.CD009252.pub2.
18. Frederice C, Mira TAA, Machado H, Brito L, Juliato C. Effect of vaginal stretching and photobiomodulation therapy on sexual function in women with pelvic floor myofascial pain: a randomized clinical trial. J Sex Med. 2022. doi:10.1016/j.jsxm.2021.10.008.
19. Muñoz-Gómez E, Alcaraz-Martínez AM, Mollà-Casanova S, Sempere-Rubio N, Aguilar-Rodríguez M, Serra-Añó P, et al. Effectiveness of a manual therapy protocol in women with pelvic pain due to endometriosis: a randomized clinical trial. J Clin Med. 2023;12(9):3310. doi:10.3390/jcm12093310.
20. Atinga A, Bashiru H, Solomon A, Oghide O, Adufe I, Aduroja P, et al. Depression and anxiety among women with polycystic ovarian syndrome in low- and middle-income countries: a systematic review and meta-analysis. Front Glob Womens Health. 2025. doi:10.3389/fgwh.2025.1688913.