

Original Article

Effect of Relaxation, Lumbopelvic Stabilization, and Strengthening on Pain, Quality of Life, and Lumbopelvic Impairments in Women with Endometriosis

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ABSTRACT

Background: Endometriosis, a chronic gynecological disorder characterized by the presence of endometrial-like tissue outside the uterus, significantly impacts the quality of life and physical functioning of affected women. Conventional treatments involve pharmacological interventions and surgery, which may not always provide long-term relief and are often associated with side effects.

Objective: This study aimed to evaluate the effects of relaxation, lumbopelvic stabilization, and strengthening exercises on pain, quality of life, and lumbopelvic impairments in women with endometriosis in Faisalabad, Pakistan.

Methods: A quasi-experimental design was employed, involving 40 women diagnosed with endometriosis, recruited from local hospitals and fitness centers. Participants underwent a structured intervention consisting of relaxation techniques, lumbopelvic stabilization, and strengthening exercises, conducted three times per week for seven weeks. Data were collected using the Visual Analogue Scale (VAS) for pain, the Endometriosis Health Profile-30 (EHP-30) for quality of life, and specific physical performance tests for lumbopelvic impairments. Statistical analysis was performed using SPSS version 25, employing repeated measures ANOVA to assess changes from baseline to post-intervention.

Results: The intervention resulted in significant reductions in pain (VAS scores decreased, $p < 0.001$), improvements in quality of life (EHP-30 scores improved in all domains, $p < 0.001$ for most domains), and enhanced lumbopelvic function (endurance test scores increased, $p < 0.001$).

Conclusion: The study findings suggest that structured physical therapy interventions can significantly improve pain, quality of life, and physical functioning in women with endometriosis. These results support the inclusion of physical therapy as a viable component of comprehensive endometriosis management.

Keywords: Endometriosis, Physical Therapy, Quality of Life, Pelvic Pain, Lumbopelvic Stabilization, Strengthening Exercises, Non-Pharmacological Treatment.

INTRODUCTION

Endometriosis is a chronic, estrogen-dependent condition that manifests as the presence of endometrial-like tissue outside the uterine cavity, leading to symptoms such as severe pelvic pain and infertility. The pathogenesis of endometriosis is still not completely understood, but it is recognized as a complex gynecological disorder that involves immune, endocrine, and inflammatory pathways (1,2). This inflammatory condition primarily affects women in their reproductive years and is estimated to impact 7-10% of this population globally; however, its prevalence can rise to as high as 50% among women suffering from infertility (3,8,9). One prevailing theory suggests that retrograde menstruation contributes to the dissemination of endometrial cells that implant and proliferate in the pelvic cavity, although genetic and environmental factors, as well as immune dysfunctions, are also believed to play crucial roles (4,5,10).

The clinical management of endometriosis is challenging and typically includes pharmacological treatment and surgery; however, these approaches are often associated with side effects and a high rate of symptom recurrence. Consequently, there is increasing

interest in alternative management strategies such as physical therapy, which may mitigate symptoms by reducing estrogen levels and modulating inflammatory responses through increased cytokine activity (6,20,21). Physical activity, particularly exercises targeting the lumbopelvic region, has been shown to be beneficial in managing pain and improving quality of life in women with this condition (8,9).

Despite the global burden of endometriosis, the literature on non-pharmacological interventions, particularly those examining structured exercise programs, remains sparse and is even scarcer in Asian populations. To the best of our knowledge, no study has specifically investigated the combined effects of relaxation, lumbopelvic stabilization, and strengthening exercises on women with endometriosis in Pakistan. This research gap highlights the need for comprehensive studies to explore the efficacy of these interventions in improving the health-related quality of life, pain, and physical impairments associated with the disease. Such studies are crucial for developing targeted, effective, and culturally appropriate management strategies for this debilitating condition (7,19).

MATERIAL AND METHODS

The study was designed as a quasi-experimental trial to explore the effects of relaxation, lumbopelvic stabilization, and strengthening exercises on pain, quality of life, and lumbopelvic impairments in women diagnosed with endometriosis. Conducted in Faisalabad, Pakistan, the sample comprised 40 women recruited from Allied Hospital, National Hospital, local gyms, and university hostels. Participants were selected using a purposive sampling technique, ensuring they met the inclusion criteria: aged 18-40, clinically diagnosed with endometriosis by a specialist, and experiencing pelvic pain for at least six months. Exclusion criteria included pregnancy, recent pelvic surgery, contraindications to physical exercise, and concurrent participation in other therapeutic interventions for endometriosis.

Prior to participation, all subjects provided written informed consent. The study was approved by the Institutional Review Board of Government College University, Faisalabad, and was conducted in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments. The intervention protocol spanned seven weeks, with sessions conducted three times per week. Each session, lasting approximately one hour, included a warm-up, a series of targeted exercises, and a cool-down phase. The exercises focused on relaxation techniques such as guided imagery and deep breathing, lumbopelvic stabilization exercises to improve core stability, and strengthening exercises aimed at enhancing muscle function in the lower back and pelvic regions.

Data were collected at baseline and upon completion of the intervention using the Endometriosis Health Profile-30 (EHP-30) to assess quality of life, and the Visual Analogue Scale (VAS) to measure pain intensity. Lumbopelvic impairments were evaluated using physical performance tests such as the slump and endurance tests. Data integrity and confidentiality were maintained throughout the study.

For data analysis, SPSS software version 25 was utilized. Descriptive statistics provided a summary of participant characteristics and baseline measures. The effectiveness of the intervention was assessed using repeated measures ANOVA to compare pre- and post-intervention scores for pain, quality of life, and physical impairment. A p-value of less than 0.05 was considered statistically significant, indicating effective intervention outcomes.

RESULTS

In this study, we analyzed the impact of relaxation, lumbopelvic stabilization, and strengthening exercises on various outcomes in women with endometriosis. The results are presented in tabular format, followed by a brief narrative explanation of the findings. Data analysis showed significant improvements across several key metrics: pain reduction, quality of life, and lumbopelvic impairments, as measured by various established tools.

Table 1: Impact of Intervention on Pain (Visual Analogue Scale)

| Description | N | Mean Rank | Sum of Ranks | P value |
|-------------------|----|-----------|--------------|---------|
| Pre-intervention | 36 | 18.50 | 666.00 | - |
| Post-intervention | 36 | 0.00 | 0.00 | <0.001 |

Table 1 shows a significant reduction in pain scores from pre- to post-intervention ($p < 0.001$), indicating that the exercise interventions were effective in managing pain in participants.

Table 2: Changes in Quality of Life (Endometriosis Health Profile-30)

| Quality of Life Indicators | Pre Mean Rank | Post Mean Rank | Sum of Ranks | P value |
|------------------------------|---------------|----------------|--------------|---------|
| Social Activities Limitation | 7.50 | 7.50 | 97.50 | 0.001 |
| Household Chores | 12.50 | 0.00 | 300.00 | <0.001 |
| Standing Difficulties | 9.50 | 0.00 | 171.00 | <0.001 |

| | | | | |
|----------------------|-------|------|--------|--------|
| Sitting Difficulties | 7.00 | 7.00 | 84.00 | 0.002 |
| Walking Difficulties | 11.00 | 0.00 | 231.00 | <0.001 |
| Exercise Limitation | 11.50 | 0.00 | 253.00 | <0.001 |

Table 2 illustrates significant improvements in various aspects of quality of life post-intervention (all p values <0.001 or 0.002). Participants reported fewer limitations in daily and recreational activities, which suggests an overall enhancement in life quality.

Table 3: Lumbopelvic Impairment Outcomes

| Test | Pre Mean Rank | Post Mean Rank | Sum of Ranks | P value |
|----------------|---------------|----------------|--------------|---------|
| Endurance Test | 11.00 | 0.00 | 231.00 | <0.001 |

Table 3 demonstrates a significant improvement in lumbopelvic endurance post-intervention ($p < 0.001$). This indicates enhanced stability and strength in the lumbopelvic region, corroborating the effectiveness of the specific stabilization and strengthening exercises provided during the treatment protocol.

In conclusion, the intervention significantly reduced pain levels, enhanced quality of life, and improved lumbopelvic impairments among the study participants. These results affirm the potential of structured physical therapy programs in the management of endometriosis-related symptoms.

DISCUSSION

The findings from this study underscore the significant therapeutic benefits of relaxation, lumbopelvic stabilization, and strengthening exercises for women with endometriosis, particularly in terms of pain management, quality of life improvements, and lumbopelvic function. These results are consistent with previous research indicating that physical therapy can ameliorate symptoms of endometriosis through mechanisms likely involving reduced inflammation and estrogen modulation (21). Notably, our study expands on the existing literature by providing evidence from a Pakistani context, where research on non-pharmacological interventions for endometriosis is scant.

Our results align with those of Muñoz-Gómez et al. (22), who demonstrated that manual therapy significantly reduced pain in women with pelvic pain due to endometriosis. Similarly, the Physio-EndEA study by del Mar Salinas-Asensio et al. (15) found that a supervised therapeutic exercise program significantly improved health-related quality of life in women with endometriosis. The improvements in lumbopelvic endurance observed in our study further substantiate findings by Mansfield et al. (16, 23), highlighting the effectiveness of pelvic floor physical therapy in enhancing function in young adults with biopsy-confirmed endometriosis.

While the study presents promising results, it is not without limitations. The quasi-experimental design and the lack of a control group limit the ability to draw definitive causal inferences from the findings. Additionally, the sample size, although adequate for initial explorations, may not provide the power necessary to generalize these results across broader populations. Furthermore, the reliance on self-reported measures for some outcomes could introduce bias, although objective measures were also used to mitigate this potential.

Future research should aim to include randomized controlled trials with larger sample sizes to better ascertain the efficacy and generalize the findings. Incorporating a control group that receives standard care or a different type of intervention could help clarify the specific effects of the exercises used in this study. Moreover, longitudinal studies would be beneficial to assess the long-term benefits and sustainability of physical therapy interventions in managing endometriosis symptoms.

The strengths of this study include its focus on a holistic treatment approach, addressing not just the physical symptoms of endometriosis but also enhancing overall quality of life. This holistic approach is crucial for chronic conditions like endometriosis, which have pervasive impacts on various aspects of patients' lives. Additionally, the use of well-validated instruments to measure outcomes provides a robust basis for the findings.

In conclusion, this study adds valuable evidence supporting the role of physical therapy in managing endometriosis, particularly in settings where access to conventional medical treatments may be limited or where patients seek non-pharmacological treatment options. It also highlights the need for healthcare professionals to consider integrating physical therapy into the broader management plans for women with endometriosis, potentially improving patient outcomes through a multi-disciplinary approach.

CONCLUSION

The study findings suggest that structured physical therapy interventions can significantly improve pain, quality of life, and physical functioning in women with endometriosis. These results support the inclusion of physical therapy as a viable component of comprehensive endometriosis management.

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