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THE ROLE OF PHYSICAL ACTIVITY IN THE MANAGEMENT OF ENDOMETRIOSIS: A LITERATURE REVIEW

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ABSTRACT

Background: Endometriosis is a chronic gynecological disorder characterized by ectopic endometrial tissue, leading to inflammation, chronic pelvic pain and reduced quality of life. While hormonal and surgical treatments remain standard, interest in non-pharmacological interventions, including physical activity, has grown due to its potential anti-inflammatory, analgesic, and psychosocial benefits.
Purpose: To evaluate the impact of physical activity on the course of endometriosis
Material and Methods: Information was collected using the english language literature databases such as PubMed and GoogleScholar. The literature from 1985-2025 was reviewed to evaluate the pain management in endometriosis. Specific attention was paid to publications on the impact of physical activity and exercises on endometriosis associated pain and the quality of life.
Results: The reviewed literature consistently indicated that physical activity contributed to a reduction in endometriosis-related symptoms, most notably chronic pelvic pain. Despite methodological heterogeneity, all studies reported either clinical or statistically significant benefits of PA in endometriosis symptom management. However, several authors emphasized the need for further standardized, large-scale trials to determine optimal exercise type, duration, and intensity.
Conclusions: Physical activity appears to be a promising complementary therapy for managing endometriosis symptoms, particularly pain and fatigue, by modulating inflammation, stress responses, and hormonal balance. While current data are encouraging, further high-quality, longitudinal studies are required to establish standardized exercise protocols and confirm long-term benefits.

KEYWORDS

Endometriosis, Physical Activity, Exercise, Pain

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Introduction

Endometriosis

Endometriosis is a chronic, estrogen-dependent bening and chronic gynecological condition characterized by the presence of endometrial-like tissue - comprising both glandular epithelium and stroma - outside the uterine cavity, most commonly within the pelvic peritoneum, ovaries, and rectovaginal septum [1,2]. This ectopic endometrial tissue undergoes cyclical bleeding, leading to chronic inflammation, fibrosis, and the formation of adhesions, which contribute to the hallmark symptoms of the disease, including dysmenorrhea, chronic pelvic pain, dyspareunia, and infertility [3,4]. The condition affects as many as 10% of women of reproductive age, with symptoms present in up to 70% of those diagnosed. [5]

Pain in Endometriosis: Characteristics and Pathophysiology

Pain is the most common and debilitating symptom of endometriosis, manifesting in various forms such as dysmenorrhea, chronic pelvic pain, non-menstrual pain, dyspareunia, and dyschezia. [6] The severity of pain does not always correlate with the extent of lesions, suggesting a complex underlying pathophysiology which includes inflammatory mediators such as IL-1β, TNF-α, and PGE_2, released by endometrial tissue, which sensitize peripheral nerves and initiate nociceptive signaling. These lesions are often highly innervated, contributing to heightened pain perception.[7] Additionally, neuroangiogenesis—mediated by factors like NGF and VEGF—facilitates abnormal nerve growth within lesions, further amplifying sensory input. Persistent stimulation may lead to central sensitization, characterized by enhanced spinal cord neuron excitability and diminished pain inhibition, contributing to chronic pain even after lesion removal. [8] These mechanisms collectively contribute to the complex pain phenotype in endometriosis, requiring a multidisciplinary approach for effective management.

Treatment of endometriosis

The management of endometriosis involves a multidisciplinary approach. Since there is no definitive cure for endometriosis, the primary goal of treatment is to manage the associated pain, typically through hormonal suppression or surgical removal of the affected tissue. [1] The treatment approach for endometriosis is tailored to the symptoms and the individual patient's preferences. Pharmacological treatments primarily focus on suppressing estrogen to reduce the growth of endometrial lesions. Hormonal therapies, including combined oral contraceptives, progestins, and GnRH agonists, are commonly used, with GnRH agonists showing efficacy in reducing pain and lesion size, though long-term use is limited by side effects. [9] Recent studies highlight the use of relugolix combination therapy, which has demonstrated superiority in controlling symptoms and improving quality of life in women with endometriosis. [10] Non-hormonal pain management with NSAIDs remains the first-line treatment for symptom relief. [11] Surgical options, particularly laparoscopic excision of lesions, are used when pharmacological methods are insufficient. Surgical intervention may involve the removal of endometriotic lesions, adhesions, and scar tissue. However, its effectiveness in relieving pain and improving fertility outcomes is often influenced by the severity and spread of the disease. Moreover, recurrence of lesions is possible even after successful surgery, and chronic pelvic pain may persist due to pelvic floor dysfunctions, such as muscle tension or anatomical abnormalities within the pelvic region. [1] Recent progress in understanding endometriosis has led to greater emphasis on non-invasive and non-pharmacological treatment strategies. International clinical guidelines now recommend incorporating physical activity and exercise into the overall management plan for women experiencing symptoms related to endometriosis. [12] Additionally, physical therapy, including pelvic floor exercises, myofascial release, and postural corrections, has shown promise in reducing chronic pelvic pain and improving mobility in women with endometriosis. [13] Emerging therapies, such as botulinum toxin injections, have shown potential in alleviating pelvic pain through muscle relaxation and nerve modulation. [14] Complementary approaches such as acupuncture have become increasingly popular among patients and as it has shown clinically significant reductions in pelvic pain associated with endometriosis, it and may be considered a viable therapeutic option. [15] Moreover, dietary interventions may play a supportive role in both the prevention and management of endometriosis and its related pain symptoms, however, the scientific evidence supporting their effectiveness remains inconclusive. [16] Recently The inflammatory characteristics of endometriosis leads to heightened sensitivity of pelvic organs, which can eventually result in chronic pelvic pain. Given that, the anti-inflammatory properties of physical activity and exercise may help slow disease progression and alleviate related pain. [17] Overall, the therapeutic approach should be individualized, balancing symptom relief, fertility preservation, and quality of life. As many recent studies have investigated the effectiveness of physical activity and exercise as supportive strategies for managing pain in endometriosis, thus this topic is the focus of this review.

State of Knowledge

Physical activity (PA) is scientifically defined as any bodily movement produced by skeletal muscles that results in energy expenditure above resting levels. This broad term encompasses various domains, including occupational, transportation, domestic, and recreational activities. [18] Physical exercise however is a structured, planned, and repetitive form of PA specifically aimed at improving or maintaining one or more components of physical fitness. [19] In the context of endometriosis, physical activity has been increasingly studied as a supportive, non-pharmacological approach to managing chronic pelvic pain (CPP). The first studies on the relationship between physical exercise and endometriosis began almost 40 years ago. The study by Cramer et al. (1986) examined the relationship between exercise and the risk of developing endometriosis. The researchers found that regular, strenuous physical activity - particularly when initiated at an early age - was associated with a decreased risk of endometriosis. This protective effect was most pronounced among women who engaged in high-intensity exercise, such as running or gymnastics, for at least two hours per week before the age of 26. The authors suggested that exercise may influence endogenous estrogen levels, thereby reducing the risk of endometriosis. [20] In the study by Carpenter et al. (1995), regular moderate aerobic exercise was associated with a significant reduction in dysmenorrhea symptoms among women with endometriosis. Participants who engaged in physical activity experienced decreased pain intensity and a lower requirement for analgesic medication. These findings suggest that exercise may serve as an effective non-pharmacological intervention for managing endometriosis-related menstrual pain. [21] the study by Koppan et al. (2010) aimed to compare the effectiveness of analgesic medications versus physical exercise in alleviating pelvic pain in women with endometriosis. The study involved 60 participants who were randomly assigned to

either a control group (receiving painkillers) or an experimental group (engaging in a structured exercise program). After 12 weeks, the exercise group showed significant improvements in pain reduction, physical function, and quality of life measures compared to the control group. [22] Regular physical exercise may exert protective effects against inflammatory conditions by increasing anti-inflammatory cytokines and reducing estrogen levels. Given that endometriosis is linked to a local peritoneal inflammatory response, the 2014 systematic review by Bonocher et al. aimed to explore the relationship between physical activity and the prevalence or symptom improvement of endometriosis. A PubMed search (1985–2012) yielded only six relevant studies out of 935, with inconclusive findings on whether exercise influences disease risk or progression, highlighting the need for randomized controlled trials back then. [17] In addition to research on the effect of physical activity on pain management in endometriosis, the relationship between physical exercise and other consequences of the disease has also been studied. The study by Awad et al. (2017) aimed to assess the impact of an 8-week exercise program on pelvic pain and posture in women with mild to moderate endometriosis. The results demonstrated a significant reduction in pain intensity and improvement in thoracic kyphosis angle, indicating that regular physical activity can effectively alleviate endometriosis-related symptoms such as postural abnormalities. [23] The study by Bergström et al. (2005) aimed to evaluate the impact of physical training on bone mineral density (BMD) in women with endometriosis undergoing gonadotropin-releasing hormone (GnRH) analog treatment. The results indicated that participants who engaged in a 12-month physical training program experienced a recovery in BMD after an initial decline during the 6-month GnRH treatment, whereas the control group continued to show a decrease in BMD over the same period. These findings suggest that incorporating physical exercise may mitigate bone loss associated with GnRH therapy in endometriosis patients. [24] Studies on the effect of physical activity on the course of endometriosis also included activities such as yoga, particularly Hatha yoga, which encompasses a variety of styles, including Iyengar and chair-based methods, and is commonly used in interventions aimed at improving physical health and reducing symptoms in various populations, such as older adults and individuals with chronic conditions. [25] The randomized controlled trial by Gonçalves et al. (2017) aimed to evaluate the effects of an 8-week Hatha yoga program on chronic pelvic pain and quality of life in women with endometriosis. Forty participants were assigned to either a yoga intervention group ($n = 28$) or a control group ($n = 12$). The yoga group attended 90-minute sessions twice weekly, incorporating postures, breathing exercises, meditation, and relaxation techniques. Upon completion, the yoga group reported a significant reduction in pain intensity, with mean visual analog scale (VAS) scores decreasing from 6.4 to 2.7 ($p < 0.001$), and notable improvements in quality of life as measured by the Endometriosis Health Profile-30 (EHP-30) questionnaire. These findings suggest that Hatha yoga may serve as an effective complementary therapy for alleviating pain and enhancing quality of life in women suffering from endometriosis. [26] A systematic review by Tennfjord et al. (2021) assessed the effect of PA and exercise on endometriosis-associated symptoms and concluded that the evidence was insufficient to determine their efficacy due to significant limitations in the included studies, such as heterogeneity in outcomes and measures, as well as confounding factors. The authors called for future research with high methodological quality to establish clear conclusions. [27] Not much later a large-scale observational study by Ensari et al. (2022), utilizing data from over 90,000 daily entries by 1,009 individuals with endometriosis, found that the relationship between daily exercise and pain symptoms was moderated by habitual exercise frequency. Specifically, those who engaged in regular exercise (at least three times per week) experienced more favorable pain outcomes following daily exercise, with a rate ratio of 0.96 (95% CI: 0.95 to 0.98, $p = 0.0007$) for day-level pain scores. These findings suggest that consistent physical activity may enhance the pain-relieving effects of exercise in endometriosis management. [28] Furthermore, a 2023 longitudinal study by Artacho-Cordón et al. explored the association between lifestyle factors and symptom burden in 879 women with endometriosis across 13 Spanish hospitals. The authors reported that those who engaged in higher levels of physical activity exhibited significantly lower symptom scores, particularly regarding fatigue and pelvic pain. [29] Few systematic reviews and meta-analyses were published recently. Abril-Coello et al. (2023) focused on non-pharmacologic conservative therapies, including exercise. The study found significant improvements in pain intensity (standardized mean difference [SMD] -0.89; 95% confidence interval [CI] -1.21 to -0.57) and physical function (SMD -1.49; 95% CI -2.88 to -0.10) among women with endometriosis engaging in such interventions. [30] Afreen et al. (2024) compared the efficacy of surgical, acupuncture, and exercise interventions in improving the quality of life for women with endometriosis. The study highlighted that while surgical interventions often provide immediate relief, they may be associated with higher recurrence rates and potential complications. Acupuncture showed promise in pain reduction but lacked standardized protocols across studies. Exercise interventions, particularly those incorporating aerobic

and strength-training components, demonstrated consistent improvements in pain management and overall quality of life, with minimal adverse effects. [31] Xie et al. (2025) evaluated six randomized controlled trials (RCTs) encompassing 251 participants to assess the efficacy of PA and exercise in women with endometriosis. The analysis revealed that PA and exercise significantly improved quality of life metrics, particularly in pain reduction ($p < 0.0001$), feelings of control and powerlessness ($p < 0.00001$), and emotional well-being ($p = 0.006$). The interventions included various forms of exercise, such as flexibility and strength training, cardiovascular fitness, and yoga, performed one to four times per week over durations ranging from 8 to 24 weeks. Despite these promising findings, the authors noted heterogeneity among the studies and emphasized the need for more high-quality, long-term RCTs to validate these results. [32] The NICE (National Institute of Health and Care Excellence) guideline NG73 on endometriosis acknowledges the impact of the condition on women's quality of life, including pain, fatigue, and emotional well-being. While it recognizes the importance of supporting self-management, the guideline notes that there is insufficient high-quality research to determine the effectiveness of lifestyle interventions such as diet and exercise in reducing symptoms like pain and fatigue. Consequently, it does not provide specific recommendations for the use of physical activity or exercise as part of routine management. However, the guideline emphasizes the need for further research to evaluate the efficacy of such interventions in managing endometriosis symptoms. [33]

Conclusions

In summary, the growing body of research highlights the promising role of physical activity and exercise as complementary, non-pharmacological strategies for managing endometriosis-related symptoms, particularly chronic pelvic pain. From early epidemiological evidence suggesting a potential protective effect of exercise on disease onset, to more recent interventional studies demonstrating significant reductions in pain intensity, improved posture, better quality of life, and even mitigation of treatment-related side effects like bone loss, physical activity emerges as a valuable tool in comprehensive endometriosis care. The hypothesis that regular physical activity may mitigate inflammatory and pain-related pathways in endometriosis has been supported. Interventions ranging from aerobic training to Hatha yoga have shown measurable improvements in pain and emotional well-being, especially when practiced regularly and tailored to individual symptom patterns. Moreover, longitudinal data and large-scale observational studies reinforce the importance of consistency in physical activity, indicating a cumulative benefit over time.

However, despite these encouraging findings, limitations persist. Many of the studies reviewed exhibit methodological heterogeneity, small sample sizes, and varying intervention protocols, which complicate direct comparisons and consensus building. The authors emphasized the need for individualized treatment plans, considering patient preferences and the potential benefits of combining multiple therapeutic approaches. While some studies report significant benefits, others highlight the need for more rigorous research to confirm these effects. Therefore, incorporating tailored PA programs into comprehensive treatment plans may offer additional relief for women suffering from endometriosis, but further high-quality studies are warranted to establish standardized guidelines. Future research aimed at developing standardized, evidence-based physical activity guidelines tailored to this patient population.

Disclosure

Authors' contribution:

Conceptualization: Karolina Marrodán-Wojtczak
Methodology: Karolina Marrodán-Wojtczak, Adrianna Zajączkowska, Radosław Kuźma
Software: Karolina Krochmal, Jan Wilk, Kacper Stępniak
Check: Aleksandra Kujawa, Paulina Krzeszowska, Jakub Jarmołowicz
Formal analysis: Adrianna Zajączkowska, Radosław Kuźma, Jan Wilk
Investigation: Karolina Marrodán-Wojtczak, Jakub Zajączkowski
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Writing - review and editing: Adrianna Zajączkowska, Karolina Krochmal, Jan Wilk
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Supervision: Aleksandra Kujawa
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