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Evaluating Pain and Quality of Life Improvement in Endometriosis: A Prospective Interventional Study

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Abstract

Background: *World-wide about 10% of reproductive-age women affects with endometriosis, drastically reducing their quality of life. This study assessed the effectiveness of a combination medicinal and lifestyle intervention approach in controlling endometriosis-related pain and enhancing quality of life.* ***Methods:*** *A prospective interventional study was conducted with 350 women diagnosed with endometriosis between August 2022 to September 2024. Participants received a structured intervention combining hormonal therapy, pain management, and lifestyle modifications. Pain scores, quality of life metrics, and symptom severity were assessed at baseline, 3 months, and 6 months.* ***Results:*** *Among 350 enrolled participants, collected for 2 years, 328 patients (93.7%) completed the six-month follow-up. Significant improvements were observed in pain scores and quality of life metrics. The mean and SD of Visual Analog Scale (VAS) pain score decreased from 7.8 ± 1.2 at baseline to 3.2 ± 1.1 in 6 months ($p < 0.001$). Quality of life scores improved by 62% from baseline.* ***Conclusion:*** *The combination therapeutic strategy showed notable efficacy in lowering pain associated with endometriosis and enhancing quality of life. These results point to the significance of a thorough treatment plan in the management of endometriosis.*

Keywords: Hormonal therapy, quality of life, endometriosis, chronic pelvic pain, and intervention study

INTRODUCTION

Endometriosis is a chronic inflammatory condition, prevalent gynecological condition characterized by the presence of endometrial-like tissue outside the uterus, affecting approximately 176 million women worldwide [1]. The condition primarily manifests through chronic pelvic pain, dysmenorrhea, and infertility, significantly impacting patients' physical and psychological well-being [2].

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The pathogenesis of endometriosis involves complex interactions between hormonal, immune, and inflammatory factors. Although the exact cause is still unknown, immune system dysfunction, environmental variables, and genetic predisposition are thought to play a role in its development.

CLINICAL PRESENTATION AND DIAGNOSIS

The clinical manifestation of endometriosis varies widely among affected individuals. Common symptoms include chronic pelvic pain, Dysmenorrhea (painful menstruation), Dyspareunia (painful intercourse), Infertility, Gastrointestinal and urinary symptoms.

Diagnosis typically requires laparoscopic visualization and histological confirmation, although imaging techniques like transvaginal ultrasound and MRI play supporting roles.

Despite advances in understanding endometriosis pathophysiology, management remains challenging, with many patients reporting inadequate pain control and reduced quality of life [3]. Current treatment approaches often focus on either hormonal suppression or surgical intervention, with varying degrees of success [4]. Previous studies have shown that various treatments, including hormonal therapies, analgesics, and surgical interventions, can alleviate symptoms, but there remains a significant gap in achieving optimal pain relief and enhancing quality of life. This study seeks to assess the impact of a standardized interventional protocol on pain reduction and improvement in quality of life in women with endometriosis.

AIM

This study aimed to evaluate the effectiveness of a comprehensive intervention program combining medical treatment with lifestyle modifications in improving pain management and quality of life among women with endometriosis.

OBJECTIVES

1. To evaluate the effectiveness of a standardized interventional protocol in reducing pain intensity among women diagnosed with endometriosis.
2. To assess the impact of the intervention on the quality of life in women with endometriosis, focusing on emotional well-being, social support, and control/powerlessness using the Endometriosis Health Profile-30 (EHP-30).

MATERIALS AND METHODS

Study Design

This study was conducted as a prospective interventional study.

Study Site

The present study was carried out at Saveera Hospital KIMS, Anantapur.

Study Period

The present study was conducted between August 2022 to September 2024 for a period of 2 years.

Study Sample

The present study was conducted among a total of N = 350 women participants aged between 18 and 45 years, diagnosed with endometriosis condition and who fulfilled the following criteria were included.

Study Criteria

Inclusion Criteria

- Women aged 18–45 years.
- Laparoscopically confirmed endometriosis.
- Chronic pelvic pain score ≥4, 6 months on VAS.
- No previous hormonal therapy within 3 months.
- Willing to participate in a 6-month follow-up.

Exclusion Criteria

- Pregnancy or planned pregnancy.
- Major psychiatric disorders.
- Other chronic pain conditions.
- Recent pelvic surgery (<6 months).
- Concurrent malignancies.

- Contraindications to hormonal therapy.

Study Approval

The study protocol was approved by the Institutional Ethics Committee (IEC/2023/045), and written informed consent was obtained from all participants.

Statistical Analysis

Data were analyzed using SPSS version 25.0. Paired t-test was used to compare intervention data (pre and post data). Results were considered significant at $p < 0.05$.

Intervention Protocol

Participants received a structured intervention including:

Hormonal Therapy (Dienogest 2 mg Daily)

- Continuous combined oral contraceptives or progestins.
- GnRH agonists with add-back therapy were indicate.

Pain Management Protocol

- NSAIDs according to standardized protocol.
- Physical therapy sessions (twice weekly).
- Cognitive behavioral therapy (monthly sessions).

Lifestyle Modification Program

- Dietary counseling.
- Exercise program.
- Stress management techniques.

Outcome Measures

Primary Outcomes

- Pain intensity (VAS score).
- Quality of life (Endometriosis Health Profile (EHP)-30).
- Symptom severity score.

Secondary Outcomes

- Medication adherence.
- Work productivity.
- Side effect profile.
- Patient satisfaction.

RESULTS

Demographic and Baseline Characteristics

Table 1 demonstrates the characteristics of study participants, the Mean ± SD in Age (in Years) 32.4 ± 6.8.

Table 1. Demographic characteristics of study participants.

Characteristic	Mean ± SD or n (%)
Age (years)	32.4 ± 6.8
BMI (kg/m²)	24.6 ± 4.2
Duration of symptoms (years)	5.8 ± 3.4
Previous surgery	124 (35.4%)
Nulliparous	198 (56.6%)
Employed	245 (70.0%)

Note: N = 350.

Pain Outcomes

Table 2 demonstrates the significant reduction in pain scores post-intervention. The mean baseline VAS score was 7.8 ± 1.2, which decreased to 3.2 ± 1.1 at the 6-month follow-up ($p < 0.001$).

Table 2. Changes in Pain Scores Over Study Period.

Time Point	VAS Score (Mean ± SD)	P-value*
Baseline	7.8 ± 1.2	–
3 months	4.6 ± 1.3	<0.001
6 months	3.2 ± 1.1	<0.001

*Note: *Compared to baseline using paired t-test.*

Table 3. Dysmenorrhea severity changes.

Severity	Baseline n (%)	6 Months n (%)	P-value
Severe	195 (55.7%)	45 (13.7%)	<0.001
Moderate	112 (32.0%)	98 (29.9%)	0.042
Mild	43 (12.3%)	185 (56.4%)	<0.001

Table 3 indicates the dysmenorrhea severity changes with respective P Value – Severe < 0.001, Moderate as 0.042 instead of < 0.042 in the content and please follow the data as per the table, Mild < 0.001.

Quality of Life Outcomes

Significant improvements were observed across all areas of the EHP-30 questionnaire, as shown in Tables 4 and 5. The most notable improvements were in pain relief and emotional well-being.

Table 4. EHP-30 core questionnaire scores.

Domain	Baseline	6 months	P-value
Pain	78.5 ± 15.2	35.4 ± 12.8	<0.001
Control/Powerlessness	65.3 ± 14.7	32.1 ± 11.5	<0.001
Emotional Well-being	72.4 ± 16.3	38.6 ± 13.2	<0.001
Social Support	58.7 ± 13.9	31.2 ± 10.8	<0.001
Self-image	61.2 ± 15.6	33.5 ± 12.4	<0.001

Table 5. Treatment Type and Time point.

Treatment Type	Mean VAS Reduction ± SD	p-Value	Time Point	Mean ± SD	P-value
Hormonal Therapy	3.8 ± 1.0	–	Baseline	7.8 ± 1.6	–
Surgical Intervention	5.2 ± 1.3	0.015	3 months	5.2 ± 1.8	<0.001
			6 months	4.0 ± 1.9	<0.001

A subgroup analysis based on treatment type revealed that patients undergoing surgical intervention showed a greater reduction in pain compared to those receiving hormonal therapy alone ($p < 0.05$).

Table 6. Pain medication usage.

Medication Type	Baseline n (%)	6 Months n (%)	P-value
NSAIDs	312 (89.1)	198 (56.6)	<0.001
Opioids	85 (24.3)	28 (8.0)	<0.001

Table 6 demonstrates the medication type, the Mean ± SD in NSAIDS and Opioids, P-Value is <0.001.

Table 7. Work Productivity Analysis.

Parameter	Baseline	6 Months	P-value
Work hours missed/month	12.3 ± 6.8	5.4 ± 4.2	<0.001
Productivity loss (%)	45.6 ± 15.3	22.8 ± 12.4	<0.001

Table 7 Indicates about work productivity analysis, the parameter includes work hours missed/ month and productivity loss (%) and the Mean ± SD for baseline is 12.3 ± 6.8, 45.6 ± 15.3 and for the 6 months is 5.4 ± 4.2, 22.8 ± 12.4 and the P-Value is <0.001.

Table 8. Medication adherence and side effects.

Parameter	n (%)
Complete adherence	289 (82.6%)
Partial adherence	39 (11.1%)
Poor adherence	22 (6.3%)
Side effects reported	98 (28.0%)

Table 8 indicates about medication adherence and side effects about different parameters, complete adherence is high with (82.6 %), and poor adherence was low with 22 (6.3%).

Table 9. Physical therapy outcomes and psychological outcomes.

Physical Therapy Outcome-Measure	Baseline	6 Months	P-Value	Psychological Outcomes Parameter	Baseline	6 Months	P-Value
Pelvic floor function score	4.2 ± 1.8	7.6 ± 1.5	<0.001	Anxiety score	15.8 ± 4.2	9.3 ± 3.8	<0.001
Movement capability score	5.1 ± 1.6	8.2 ± 1.3	<0.001	Depression score	14.2 ± 3.9	8.1 ± 3.5	<0.001

Table 9 indicates about Physical therapy outcome measure and psychological outcomes with the P-Value is <0.001.

Table 10. Patient satisfaction scores at 6 months.

Aspect	Mean ± SD	Satisfaction Level	n (%)
Overall treatment	8.2 ± 1.4	Very satisfied	198 (56.6%)
Pain management	7.8 ± 1.6	Satisfied	89 (25.4%)
Provider communication	8.5 ± 1.2	Neutral	41 (11.7%)
Support services	8.1 ± 1.5	Dissatisfied	22 (6.3%)

Table 10 indicates about the aspects like patient satisfaction scores at 6 months with overall treatment 8.2 ± 1.4 and satisfaction levels- very satisfied n (%) is 198 (56.6%).

Table 11. Side effects and complications.

Event	n (%)
Hormonal side effects	89 (25.4)
Gastrointestinal complaints	45 (12.9)
Treatment discontinuation	28 (8.0)

Table 11 summaries the Side effects and complications like Harmonal side effects 89 (25.4%), which is higher, and the least was observed with treatment discontinuation 28 (8.0%).

Secondary Outcomes

The intervention significantly reduced healthcare utilization and increased job productivity. After six months, the mean number of sick days dropped from 4.2 ± 2.1 days per month at baseline to 1.3 ± 1.0 days per month ($p < 0.001$).

DISCUSSION

After implementing a thorough treatment plan, this prospective interventional trial showed notable improvements in endometriosis patients' quality of life and pain management.

The marked reduction in VAS pain scores (58.9% decrease) aligns with previous studies investigating combined therapeutic approaches [5–10].

The improvement in quality-of-life metrics across all EHP-30 domains suggests that a multifaceted intervention strategy may be more effective than single-modality treatments [8–10] The high adherence rate (82.6%) indicates good acceptability of the intervention protocol.

Our findings support the growing evidence that lifestyle modifications and complementary therapies, when combined with conventional medical treatment, can enhance outcomes in endometriosis management [11–19]. The significant reduction in healthcare utilization and work absenteeism has important socioeconomic implications.

The significant decline in the use of painkillers a decline of 33.5% in NSAID use and 16.3% decrease in opioid use was especially remarkable [20–30].

All EHP-30 domains showed improvements in quality of life, with pain management and emotional well-being showing the biggest increases. These results are consistent with earlier studies emphasizing the significance of treating endometriosis's psychological and physical components [31].

STRENGTHS AND LIMITATIONS

The high sample size, prospective design, and thorough outcome assessment are among its strong points. Limitations comprise the single-center nature of the study, Potential recall bias in symptom reporting and the relatively short follow-up period.

CONCLUSIONS

This study demonstrated that a structured, comprehensive intervention program and explained about the effectiveness of a multimodal intervention approach in managing endometriosis can significantly symptom management, improve pain management and quality of life in women with endometriosis. The high adherence rates and patient satisfaction scores suggest good acceptability of the intervention.

CLINICAL IMPLICATIONS

These findings support the implementation of integrated treatment approaches in clinical practice, combining medical therapy with lifestyle interventions for optimal outcomes in endometriosis management.

Funding

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Conflict of Interest

None declared.

Ethical Approval

The study was approved by the Institutional Ethics Committee.

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