

## Original Article

# Effect of dyadic coping-based couple psychological intervention on preoperative anxiety and postoperative pain in ectopic pregnancy patients

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Received October 23, 2024; Accepted December 26, 2024; Epub April 15, 2025; Published April 30, 2025

**Abstract:** Objective: To evaluate the effect of dyadic coping-based couple psychological intervention on preoperative anxiety and postoperative pain in ectopic pregnancy patients. Methods: A retrospective study was conducted with 100 ectopic pregnancy patients from Wuhan Children's Hospital between January 2022 and April 2024. Participants were divided into two groups: 50 in the control group (standard psychological intervention) and 50 in the observation group (dyadic coping-based psychological intervention). Outcomes were assessed using the State-Trait Anxiety Inventory (STAI), Connor-Davidson Resilience Scale (CD-RISC), Visual Analog Scale (VAS), Self-Rating Depression Scale (SDS), and Short Form-36 (SF-36). Data analysis was performed using SPSS 27.0. Results: The observation group exhibited significantly higher CD-RISC and lower STAI scores (both  $P < 0.001$ ) compared to the control group. SDS scores were also lower in the observation group ( $P = 0.044$ ). Postoperative VAS scores and SF-36 scores (both  $P < 0.05$ ) were significantly improved in the observation group at days 1, 3, and 7. Complication rates were lower in the observation group (2% vs. 18%,  $P = 0.008$ ). Correlation analysis revealed higher postoperative CD-RISC scores ( $\rho = 0.411$ ,  $P < 0.001$ ) and lower S-AI ( $\rho = -0.297$ ,  $P = 0.003$ ), T-AI scores ( $\rho = -0.498$ ,  $P < 0.001$ ) and SDS scores ( $\rho = -0.217$ ,  $P = 0.030$ ) were associated with better recovery. A higher complication rate was negatively correlated with recovery ( $\rho = -0.267$ ,  $P = 0.007$ ), while better physical functioning (PF) ( $\rho = 0.227$ ,  $P = 0.023$ ) was positively correlated with recovery. Conclusion: Dyadic coping-based couple psychological intervention reduces preoperative anxiety and postoperative pain in ectopic pregnancy patients, enhances psychological resilience, and improves quality of life, fostering better health outcome and recovery.

**Keywords:** Dyadic coping, psychological intervention, ectopic pregnancy, postoperative pain, psychological resilience

## Introduction

Ectopic pregnancy, also known as extrauterine pregnancy, occurs when a fertilized egg implants outside the uterus, most commonly in the fallopian tubes [1, 2]. It can also occur in other locations, such as the uterine cornua, cervix, ovaries, or abdominal cavity [3]. The condition is classified as ectopic as long as the fertilized egg does not implant in the normal uterine location [3]. Symptoms typically include missed periods, sudden severe lower abdominal pain, acute anemia, and vaginal bleeding [4, 5]. Ectopic pregnancy may be life-threaten-

ing due to the risk of significant bleeding, making it a critical acute abdominal issue that requires immediate medical attention.

Treatment options for ectopic pregnancy include surgical and conservative approaches [6]. In cases of suspected or confirmed ectopic pregnancy with acute internal bleeding or shock, urgent surgical intervention is required. Surgical treatments may involve salpingectomy or more conservative options such as salpingostomy, fallopian tube incision with embryo retrieval, or tubal end-pressing surgery [7]. Stable ectopic pregnancies may be managed

# Dyadic coping-based couple psychological intervention in ectopic pregnancy patients

conservatively, using medication to terminate the pregnancy and allow for spontaneous reabsorption. However, if complications such as severe abdominal pain or bleeding arise, surgical intervention may be necessary [1].

Patients with ectopic pregnancy often experience preoperative anxiety and postoperative pain, which can lead to physiologic responses such as elevated blood pressure and increased heart rate, affecting surgery and recovery. Dyadic coping, a concept introduced by Folkman and Lazarus in 1984, focuses on the collaborative process between individuals or partners in managing stress, aimed at maintaining psychological and physiological health, as well as relationship balance [8, 9]. In dyadic coping, both partners form a dynamic system, providing mutual support, coordinating perceptions, evaluations, and problem-solving. This shared stress experience can enhance relationship resilience, improve satisfaction, and even predict future relationship outcomes.

This study investigates the impact of a dyadic coping-based couple psychological intervention on preoperative anxiety, postoperative pain, and psychological resilience in ectopic pregnancy patients.

## Materials and methods

### Subjects

A retrospective study was conducted on 100 patients diagnosed with ectopic pregnancy, admitted to Wuhan Children's Hospital between January 2022 and April 2024. Patients were divided into two groups according to the management strategies they received: an observational group (50 individuals) and a control group (50 individuals). Inclusion criteria required a clinical diagnosis of ectopic pregnancy and an indication for surgery at Wuhan Children's Hospital. Exclusion criteria included severe gynecological diseases, abnormal mental states, severe heart, liver, or kidney conditions, or infectious diseases. The study was approved by the Institutional Review Board and Research Ethics Committee of Wuhan Children's Hospital.

### Methods

*Control group:* Conventional psychological interventions were implemented, which included.

*Psychological Assessment:* A comprehensive assessment was conducted before treatment to evaluate the patient's psychological state, concerns, and fears, along with their coping abilities, social support, and mental health history.

*Emotional Support:* Patients received emotional support to help manage anxiety, depression, and fear. Encouragement was provided to express feelings, listen to concerns, and offer positive feedback.

*Education and Guidance:* Information about ectopic pregnancy was provided, covering etiology, treatment options, potential complications, and prognosis. This aimed to help patients better understand and accept their condition, alleviating fears of the unknown.

*Psychological Counseling:* Counseling was offered to help patients adjust their mindset, reduce psychological stress, and build confidence in overcoming the disease.

*Family Support:* Family members were encouraged to participate in the psychological intervention process, offering emotional support and companionship. They were also educated about the patient's condition and treatment to better assist the patient.

*Follow-up and Monitoring:* Regular follow-ups were conducted to assess the patient's psychological status and treatment outcome. Psychological interventions were adjusted as needed to ensure continued effectiveness.

*Observation group:* Dyadic coping-based couple psychological interventions were implemented, which included.

*Joint Learning:* Under medical staff guidance, couples set clear goals to understand the causes, treatment methods, and risks associated with ectopic pregnancy. Scheduled study sessions with in-depth learning ensured coherence, and interactive discussions were held to enhance understanding and develop coping strategies. Learning outcomes were recorded for review, and couples were encouraged to seek medical guidance when needed. Continuous attention was given to the latest research on ectopic pregnancy to stay informed about treatment advancements and reduce disease risks.

## Dyadic coping-based couple psychological intervention in ectopic pregnancy patients

**Emotional Support:** Both partners received emotional support to navigate challenges, including comfort, encouragement, and attentive listening.

**Joint Decision-Making:** Both partners actively participated in treatment decision-making, jointly formulating treatment plans to improve communication and understanding between them.

**Mutual Coping:** Couples collaboratively faced the challenges and stress of ectopic pregnancy, solving problems together, building trust, and strengthening their bond.

**Role Adjustment:** Both partners adjusted their roles and responsibilities within the family through mutual negotiation and adaptation during the treatment process.

**Psychological Resilience Training:** Medical staff taught coping skills, emotional regulation techniques, and activities to enhance self-awareness and self-efficacy. Through simulations and role-playing, couples learned to remain calm and optimistic during adversity and to find solutions to problems. This training helped strengthen their psychological resilience to better manage the psychological challenges of ectopic pregnancy.

Postoperative recovery was assessed by evaluating changes in psychological resilience, anxiety, depression, pain levels, and quality of life using standardized scales at multiple time points before and after surgery. The incidence of complications was also monitored. Surgical interventions for ectopic pregnancy included both laparoscopic and open surgeries, with the choice of procedure depending on each patient's clinical condition. Experienced surgeons performed these procedures according to standard protocols.

**Observation indexes: Baseline Characteristics:** Comparison of baseline characteristics between the two groups of patients.

**Psychological Resilience:** The psychological resilience of patients and their spouses was assessed before and after management using the Connor-Davidson Resilience Scale (CD-RISC) [10]. This scale consists of 25 items, each scored from 0 to 4, with a total score

range of 0 to 100. A higher score indicates greater psychological resilience.

**Anxiety Levels:** Anxiety levels before and after management were assessed using the State-Trait Anxiety Inventory (STAI) [11]. The STAI includes two dimensions: state anxiety (S-AI) and trait anxiety (T-AI), each with 20 items scored on a scale from 1 to 4. Higher scores indicate more severe anxiety.

**Depression Levels:** Depression levels before and after management were assessed using the Self-Rating Depression Scale (SDS) [12]. The scale consists of 20 items, with a total possible score of 100, where higher scores indicate more severe depression.

**Pain Levels:** Pain levels were measured before surgery and on postoperative days 1, 3, and 7 using the Visual Analog Scale (VAS) [13], which rates pain intensity from 0 to 10. Higher scores indicate more intense pain.

**Quality of Life:** The quality of life of patients was assessed preoperatively and one month postoperatively using the Short Form-36 (SF-36) health survey [14]. The questionnaire includes four dimensions: Vitality (VT), Physical Functioning (PF), General Health (GH), and Social Functioning (SF). Each dimension is rated on a scale from 0 to 100, where higher scores indicate better quality of life.

**Incidence of Complications:** The incidence of complications, including incision infection, subcutaneous hematoma, abdominal distension, nausea, and vomiting, was compared between the two groups.

### *Statistical analysis*

Statistical analyses were conducted using SPSS version 27.0 (SPSS Inc., Chicago, IL, USA). Graphs and figures were generated using GraphPad Prism version 9.0 (GraphPad Software, San Diego, CA, USA), which created visual representations of the data, including bar charts, line graphs, and scatter plots, to aid in result interpretation. Continuous variables were expressed as means  $\pm$  standard deviation (SD), while categorical variables were presented as frequencies and percentages. Independent samples t-tests were used to compare continuous variables between the control and

**Table 1.** Comparison of general data between groups

Data	Control (n = 50)	Observation (n = 50)	t/ $\chi^2$	P
Age (years)	32.12 ± 5.15	31.94 ± 3.46	0.205	0.838
BMI (kg/m <sup>2</sup> )	21.15 ± 4.31	21.23 ± 3.24	0.105	0.917
Education [n (%)]			1.376	0.848
Primary school and below	3 (6.00%)	1 (2.00%)		
Middle school	15 (30.00%)	17 (34.00%)		
High school	14 (28.00%)	16 (32.00%)		
Junior college and above	18 (36.00%)	16 (32.00%)		
Family Income [n (%)]			0.088	0.957
< CNY 6000	7 (14.00%)	6 (12.00%)		
≥ CNY 6000	43 (86.00%)	44 (88.00%)		
Production [n (%)]			0.832	0.660
0-2 times	35 (70.00%)	39 (78.00%)		
> 2 times	15 (30.00%)	11 (22.00%)		
Labor [n (%)]			0.367	0.832
0-3 times	30 (60.00%)	27 (54.00%)		
> 3 times	20 (40.00%)	23 (46.00%)		
Surgical type [n (%)]			0.877	0.645
Open	14 (28.00%)	10 (20.00%)		
Laparoscopy	36 (72.00%)	40 (80.00%)		
Surgical time [n (%)]			0.694	0.706
< 2 h	30 (60.00%)	34 (68.00%)		
≥ 2 h	20 (40.00%)	16 (32.00%)		
Intraoperative bleeding [n (%)]			0.040	0.980
< 100 mL	25 (50.00%)	26 (52.00%)		
≥ 100 mL	25 (50.00%)	24 (48.00%)		
In-hospital time [n (%)]			1.000	0.606
< 4 d	23 (46.00%)	28 (56.00%)		
≥ 4 d	27 (54.00%)	22 (44.00%)		

Note: BMI, body mass index; CNY, Chinese Yuan.

experimental groups. For categorical data, the chi-square test was employed. Repeated measures ANOVA was used to analyze data collected at multiple time points (e.g., preoperative, postoperative days 1, 3, and 7) to assess within-group changes over time and between-group differences. Post-hoc pairwise comparisons were performed with Bonferroni correction to identify specific time points with significant differences. This method accounts for the correlation between repeated measurements on the same subjects. Pearson's correlation coefficient was used for parametric data, and Spearman's rank correlation coefficient was used for non-parametric data to examine the relationships between psychological intervention metrics and postoperative recovery indicators (such as anxiety, depression, pain levels,

and quality of life). A *P*-value of less than 0.05 was considered significant.

## Results

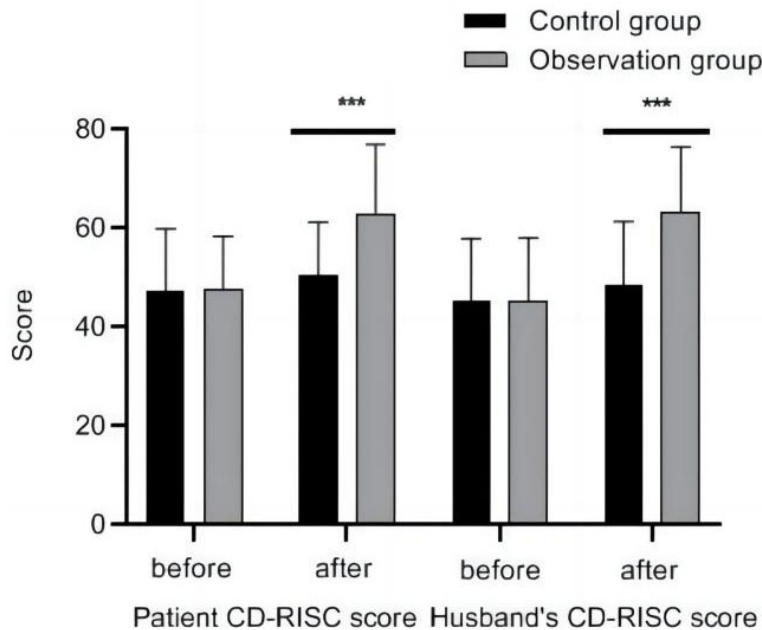
### *Comparison of general data between the two groups*

**Table 1** demonstrates that there were no significant differences between the control and observation groups in terms of age ( $t = 0.205$ ,  $P = 0.838$ ), BMI ( $t = 0.105$ ,  $P = 0.917$ ), education level ( $\chi^2 = 1.376$ ,  $P = 0.848$ ), family income ( $\chi^2 = 0.088$ ,  $P = 0.957$ ), number of pregnancies ( $\chi^2 = 0.832$ ,  $P = 0.660$ ), number of labors ( $\chi^2 = 0.367$ ,  $P = 0.832$ ), surgical type ( $\chi^2 = 0.877$ ,  $P = 0.645$ ), surgical time ( $\chi^2 = 0.694$ ,  $P = 0.706$ ), intraoperative bleeding ( $\chi^2 = 0.040$ ,  $P = 0.980$ ), or length of hospital stay ( $\chi^2 = 1.000$ ,  $P =$

**Table 2.** Comparison of psychological resilience in patients and their husbands before and after intervention

	Case	Patient CD-RISC score		Husband CD-RISC score	
		Before	After	Before	After
Control	50	47.46 ± 12.51	50.66 ± 10.64	45.27 ± 12.62	48.65 ± 12.81
Observation	50	47.52 ± 10.92	62.84 ± 14.16	45.22 ± 12.85	63.22 ± 13.26
t		0.026	4.863	0.020	5.588
P		0.980	0.000	0.984	0.000

Note: CD-RISC, Connor-Davidson Resilience Scale.



**Figure 1.** Changes in psychological resilience. Note: CD-RISC, Connor-Davidson Resilience Scale; \*\*\*,  $P < 0.001$ .

0.606). These results indicate that the baseline characteristics were well balanced between the two groups, ensuring comparability for subsequent analyses of preoperative anxiety, postoperative pain, and complication rates.

*Comparison of psychological resilience in patients and their husbands before and after intervention*

There were no significant differences in the CD-RISC scores between the control and observation groups for either patients ( $t = 0.026$ ,  $P = 0.980$ ) or their husbands ( $t = 0.020$ ,  $P = 0.984$ ) before intervention. However, after the intervention, the CD-RISC scores for both patients ( $t = 4.863$ ,  $P < 0.001$ ) and their husbands ( $t = 5.588$ ,  $P < 0.001$ ) in the observation group were significantly higher than those of the con-

trol group. See **Table 2** and **Figure 1**.

*Comparison of negative emotions before and after intervention between the two groups*

*Comparison of anxiety before and after intervention between the two groups:* Prior to the intervention, there were no significant differences in S-AI ( $t = 0.436$ ,  $P = 0.663$ ) or T-AI ( $t = 0.269$ ,  $P = 0.789$ ) scores between the two groups. However, following the intervention, the S-AI scores in the observation group (mean =  $40.47 \pm 6.21$ ) were significantly lower than those in the control group (mean =  $45.72 \pm 8.52$ ) ( $t = 3.521$ ,  $P = 0.001$ ). Similarly, the T-AI scores in the observation group (mean =  $38.13 \pm 8.54$ ) were significantly lower than those of the control group (mean =  $46.16 \pm 7.22$ ) ( $t = 5.077$ ,  $P < 0.001$ ). See **Table 3** and **Figure 2**.

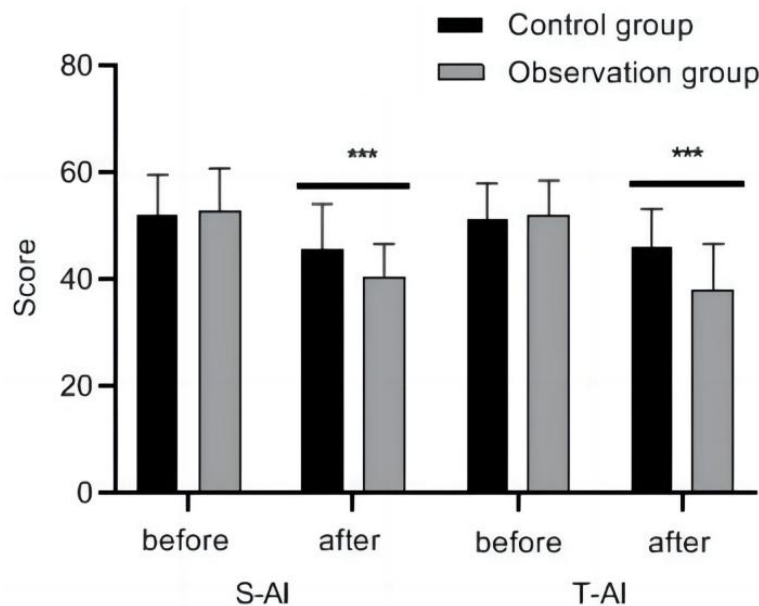
Control group. See **Table 2** and **Figure 1**.

*Comparison of depression before and after intervention between the two groups:* **Table 4** and **Figure 3** show that there were no statistically significant differences in the SDS scores between the control ( $51.47 \pm 6.38$ ) and observation ( $51.56 \pm 6.12$ ) groups before intervention ( $t = 0.078$ ,  $P = 0.938$ ). However, after the intervention, the SDS scores in the observation group ( $35.71 \pm 7.46$ ) were significantly lower than those of the control group ( $38.77 \pm 7.53$ ) ( $t = 2.038$ ,  $P = 0.044$ ). These findings suggest that while both groups experienced a decrease in depression levels after the intervention, the dyadic coping-based psychological intervention

**Table 3.** Comparison of anxiety before and after intervention between groups

	Case	S-AI score		T-AI score	
		Before	After	Before	After
Control	50	52.16 ± 7.51	45.72 ± 8.52	51.52 ± 6.67	46.16 ± 7.22
Observation	50	52.84 ± 8.06	40.47 ± 6.21	51.88 ± 6.73	38.13 ± 8.54
t		0.436	3.521	0.269	5.077
P		0.663	0.001	0.789	0.000

Note: S-AI, state anxiety; T-AI, trait anxiety.



**Figure 2.** Changes in anxiety. Note: S-AI, state anxiety; T-AI, trait anxiety; \*\*\*,  $P < 0.001$ .

resulted in a more substantial reduction in depression in the observation group compared to the control group.

*Comparison of pain levels before surgery and on postoperative days 1, 3, and 7 between the two groups*

The comparison of pain levels before surgery between the two groups showed no significant differences ( $t = 0.316$ ,  $P = 0.753$ ). However, on postoperative days 1, 3, and 7, the pain scores in the observation group were significantly lower than those of the control group (Day 1:  $t = 2.252$ ,  $P = 0.027$ ; Day 3:  $t = 2.057$ ,  $P = 0.042$ ; Day 7:  $t = 2.411$ ,  $P = 0.018$ ), as shown in **Table 5** and **Figure 4**. These results suggest that the dyadic coping-based psychological intervention effectively alleviated postoperative pain in the observation group compared to the control group, suggesting a beneficial effect on pain management following surgery.

*Comparison of quality of life preoperatively and 1 month postoperatively between the two groups*

**Table 6** shows that there were no significant differences in SF-36 scores between the control and observation groups preoperatively for the following: VT ( $t = 0.038$ ,  $P = 0.970$ ), PF ( $t = 0.035$ ,  $P = 0.972$ ), GH ( $t = 0.038$ ,  $P = 0.970$ ), and SF ( $t = 0.045$ ,  $P = 0.965$ ). One month postoperatively, however, the SF-36 scores for the observation group were significantly higher than those in the control group for VT ( $t = 2.157$ ,  $P = 0.033$ ), PF ( $t = 2.092$ ,  $P = 0.039$ ), GH ( $t = 2.125$ ,  $P = 0.036$ ), and SF ( $t = 2.049$ ,  $P = 0.043$ ). These

findings suggest that the dyadic coping-based psychological intervention positively influenced the quality of life in the observation group compared to the control group, highlighting significant benefits in various aspects of patient well-being following surgery.

*Comparison of complication rates between the two groups*

The incidence of complications in the observation group (2.00%) was significantly lower than in the control group (18.00%) ( $\chi^2 = 7.111$ ,  $P = 0.008$ ), as presented in **Table 7**.

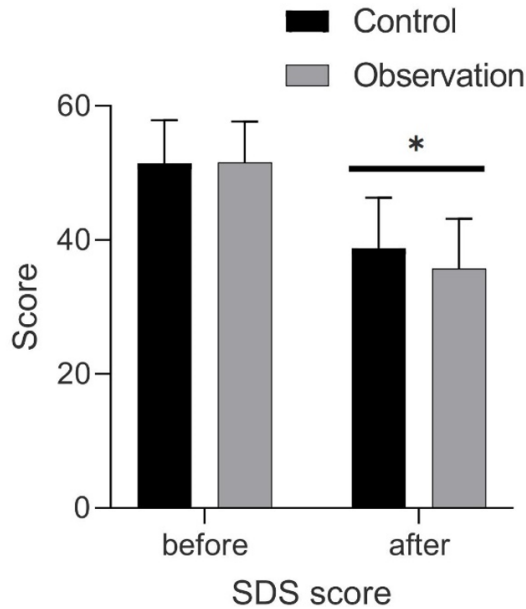
*Correlation analysis of psychological intervention measures with postoperative recovery in patients with ectopic pregnancy*

Correlation analysis of the psychological intervention measures with postoperative recovery revealed several significant relationships (**Table**

**Table 4.** Comparison of depression before and after intervention between groups

	Case	SDS score	
		Before	After
Control	50	51.47 ± 6.38	38.77 ± 7.53
Observation	50	51.56 ± 6.12	35.71 ± 7.46
t		0.078	2.038
P		0.938	0.044

Note: SDS, Self-Rating Depression Scale.



**Figure 3.** Comparison of depression before and after intervention between groups. Note: SDS, Self-Rating Depression Scale; \*,  $P < 0.05$ .

8). Higher postoperative CD-RISC scores ( $\rho = 0.411, P < 0.001$ ) and lower postoperative S-AI ( $\rho = -0.297, P = 0.003$ ), T-AI ( $\rho = -0.498, P < 0.001$ ), and SDS scores ( $\rho = -0.217, P = 0.030$ ) were positively correlated with better postoperative recovery. In contrast, a higher incidence of complications ( $\rho = -0.267, P = 0.007$ ) was negatively correlated with postoperative recovery. Additionally, better postoperative PF ( $\rho = 0.227, P = 0.023$ ) was positively correlated with improved recovery. While the correlations between postoperative pain scores and quality-of-life domains (VT, GH, SF) with postoperative recovery were not statistically significant, they showed borderline significance, suggesting a trend toward better recovery with improved vitality, general health, and social functioning. Overall, these findings indi-

cate that the dyadic coping-based psychological intervention positively affects postoperative recovery by enhancing psychological resilience, reducing anxiety and depression, and correlating with better physical functioning and a lower incidence of complications.

**Discussion**

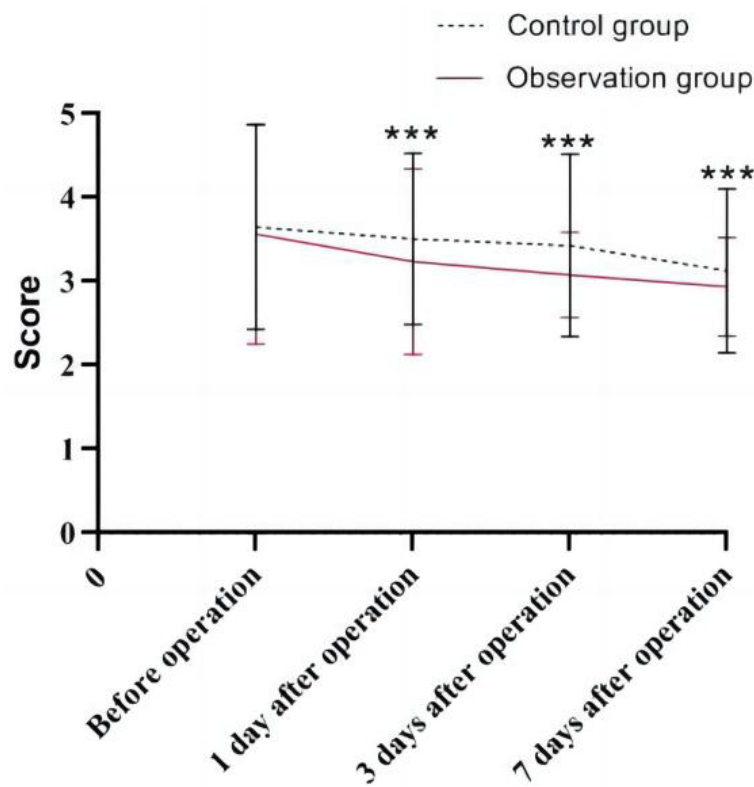
Ectopic pregnancy is a gynecological emergency that causes significant psychological stress and physical suffering for both patients and their families. During the diagnosis and treatment process, patients face not only the physiological trauma resulting from surgery but also psychological pressure from the disease and the surgical procedure itself [15-17]. In recent years, the dual coping-based, couple-focused psychological intervention has gained increasing attention. This intervention model emphasizes mutual support and joint coping between spouses, aiming to alleviate psychological stress and improve treatment outcomes [18]. This study sought to investigate the impact of this dual coping-based, couple-focused intervention on preoperative anxiety, postoperative pain, and psychological resilience in patients with ectopic pregnancy.

The results of this study indicate that the psychological resilience of both patients and their husbands in the observation group was significantly higher than in the control group after the intervention. This finding aligns with previous research demonstrating the effectiveness of dyadic coping in enhancing psychological resilience [19, 20]. This improvement may be attributed to the intervention’s focus on fostering emotional connection and psychological support between spouses. Throughout the intervention, healthcare professionals encouraged both partners to openly share their feelings and concerns, fostering emotional resonance and support. This shared experience likely enhanced their confidence and resilience in facing challenges together. For example, a study by Ștefănuț et al. emphasized the role of shared emotional experiences in strengthening relational bonds and individual resilience [21].

Subsequent investigations into anxiety, depression, and pain levels among patients revealed that individuals in the observation cohort exhibited significantly lower STAI and SDS scores compared to those in the control group.

**Table 5.** Comparison of pain before surgery and on postoperative days 1, 3, and 7 in the two groups of patients (scores)

	Case	Before	1 day	3 days	7 days
Control	50	3.65 ± 1.22	3.51 ± 1.02	3.43 ± 1.09	3.33 ± 0.98
Observation	50	3.57 ± 1.31	3.10 ± 0.82	3.08 ± 0.51	2.94 ± 0.59
t		0.316	2.252	2.057	2.411
P		0.753	0.027	0.042	0.018



**Figure 4.** Changes in pain. \*\*\*,  $P < 0.001$ .

Additionally, the pain levels reported by patients in the observation group on postoperative days 1, 3, and 7 were significantly lower than those of the control group. This finding is consistent with the work of Navarrete et al. [22], which demonstrated that social support, particularly from intimate partners, significantly reduces anxiety and depression.

This effect may be due to the ample psychological support provided by healthcare providers during the intervention, which helped alleviate feelings of tension, fear, and anxiety. As a result, patients approached surgery and treatment with a calmer, more positive mindset, reducing their anxiety levels. The couple-focused psychological intervention emphasizes

mutual coping and family support between spouses, including emotional companionship, comfort, and practical caregiving in daily life. When patients feel supported and understood by their families, their anxiety is effectively alleviated [23-25].

Furthermore, the involvement and support of the patients' husbands appeared to help patients cope better with postoperative pain. This finding is consistent with previous studies highlighting the importance of psychological support in pain management [26, 27]. Husbands can provide timely care and emotional support during pain episodes, reducing the intensity of the pain experience. This is supported by a meta-analysis by Farren et al., which found that social support, especially from close relationships, is associated with better pain management and reduced pain intensity [26].

Through psychological resilience training, patients and their husbands may learn to cope more effectively with stress and challenges. This enhancement of psychological resilience allows patients to remain calmer and more rational in the face of pain and negative emotions, thereby reducing their suffering. Intervention measures may also include educating patients about the disease and pain, which, by increasing their understanding and acceptance of discomfort during treatment, can reduce anxiety, depression, and pain scores [28].

Furthermore, the quality of life scores for VT, PF, GH, and SF were significantly higher in the



**Table 6.** Comparison of quality of life preoperatively and 1 month postoperatively between the two groups of patients (scores)

Data	Time	Control (n = 50)	Observation (n = 50)	t	P
VT	Before	49.23 ± 11.17	49.31 ± 11.21	0.038	0.970
	After	53.56 ± 11.42	58.47 ± 11.35	2.157	0.033
PF	Before	46.34 ± 11.52	46.42 ± 11.60	0.035	0.972
	After	47.49 ± 11.76	52.38 ± 11.63	2.092	0.039
GH	Before	56.45 ± 10.76	56.37 ± 10.81	0.038	0.970
	After	57.64 ± 10.85	62.17 ± 10.47	2.125	0.036
SF	Before	59.63 ± 9.28	59.71 ± 9.32	0.045	0.965
	After	60.49 ± 9.37	64.36 ± 9.49	2.049	0.043

Note: VT, Vitality; PF, Physical Functioning; GH, General Health; SF, Social Functioning.

**Table 7.** Comparison of the incidence of complications between groups

	Case	Abdominal distension	Nausea and vomiting	Rate (%)
Control	50	4	5	18.00
Observation	50	0	1	2.00
χ <sup>2</sup>				7.111
P				0.008

**Table 8.** Correlation analysis of psychological intervention measures with postoperative recovery in patients

Data	rho	P Value
After-Patient CD-RISC score	0.411	<i>P</i> < 0.001
After-S-AI score	-0.297	0.003
After-T-AI score	-0.498	<i>P</i> < 0.001
After-SDS score	-0.217	0.030
1 day-pain	-0.189	0.060
3 day-pain	-0.187	0.062
7 day-pain	-0.168	0.095
After-VT	0.195	0.052
After-PF	0.227	0.023
After-GH	0.193	0.054
After-SF	0.189	0.060
Rate (%)	-0.267	0.007

Note: "Postoperative Recovery" refers to the improvements or changes observed in these variables after surgery, including psychological resilience, anxiety, depression, pain levels, quality of life, and complication rates.

observation group one month postoperatively. This suggests that the intervention improved multiple aspects of patient well-being, beyond reducing anxiety and pain. The improvements in physical and social functioning indicate a more holistic recovery, supporting the notion that the psychological intervention contributed to better overall health outcomes [29, 30].

Similarly, Zhang et al. found that social support and psychological interventions significantly enhance the quality of life in patients undergoing medical treatments [31].

The study also revealed a notably lower incidence of complications in the observation group compared to the control group. This reduction in complications can be attributed to the psychological intervention, which alleviated patients' anxiety and enhanced their psychological resilience. As a result, patients faced treatment with a more positive and peaceful mindset. Strengthened emotional connections and support between spouses also facilitated better postoperative home care, reducing complications related to inadequate care [23, 27]. These findings are consistent with Chen et al.'s work, which reported that psychological interventions improve immune function and reduce postoperative complications [32].

Correlation analysis showed that higher postoperative CD-RISC scores and lower S-AI and T-AI scores were positively correlated with better postoperative recovery. Conversely, higher postoperative SDS scores and a higher incidence of complications were negatively correlated with recovery. These results align with previous studies indicating that enhanced psychological resilience and reduced negative

emotions contribute to better recovery outcomes [33-35]. Additionally, better postoperative PF was positively correlated with improved recovery, reinforcing the importance of addressing both psychological and physical aspects of recovery. Yang et al. similarly found correlations between psychological resilience and physical recovery, emphasizing the need for integrated care approaches [36].

The clinical significance of this study lies in demonstrating that a dyadic coping-based, couple-focused psychological intervention can effectively reduce preoperative anxiety and postoperative pain, enhance psychological resilience, and improve the quality of life in patients with ectopic pregnancy. These findings have several important clinical implications. First, by reducing anxiety and pain, the intervention may lead to smoother surgical procedures, faster recovery, and improved patient outcome, while reducing the risk of complications. Second, the intervention benefits not only the patients but also their partners, enhancing mutual support and psychological resilience, which are crucial for overall well-being. Third, reducing complications and improving recovery can shorten hospital stays and lower healthcare costs, making the intervention a cost-effective approach to managing ectopic pregnancy. Finally, this intervention emphasizes a holistic approach to patient care, addressing both psychological and physical aspects, which can serve as a model for managing other high-stress medical conditions.

However, this study has limitations. The relatively small sample size may limit the generalizability and reliability of the findings. A larger sample would provide more robust data and help mitigate random errors. Additionally, the lack of long-term follow-up restricts the ability to evaluate fully the lasting effects of psychological interventions on complication rates. Future research should refine methodological approaches and include long-term follow-up to better assess the impact of psychological interventions on complication incidence in ectopic pregnancy patients.

In summary, the couple-focused, dual coping psychological intervention effectively reduced postoperative anxiety and depression, alleviated pain, improved quality of life, and enhanced

psychological resilience in both patients and their husbands. This model, which emphasizes mutual support and joint coping, fosters a harmonious marital relationship and promotes overall health and recovery. Future research should validate the findings using refining intervention methods and include long-term follow-up studies.

### Disclosure of conflict of interest

None.

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