



Comparison of the effectiveness of intensive psychodynamic therapy and emotion-focused cognitive behavioral therapy based on the SPARS model on rumination and depression in infertile women

Azita Bagheri¹, Narges Mirani Sargazi², Azam Mohammadi Matin³,
*Mehdi Akbarzadeh⁴, Fatemeh Nasripour⁵

¹Department of General Psychology, Faculty of Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran.

²Department of Educational Sciences and Psychology, Faculty of Psychology and Educational Sciences, Shiraz University, Iran.

³Department of Educational Sciences, Faculty of Psychology and Educational Sciences, University of Birjand, Birjand, Iran.

⁴Career Counseling Department, Faculty of Psychology, Neyshabur Branch, Islamic Azad University, Neyshabur, Iran.

⁵Department of Torbat Psychology, Faculty of Medicine, Zahedan Branch, Islamic Azad University, Zahedan, Iran.

Abstract

Introduction: Depression and rumination are prevalent among infertile women, requiring effective interventions. This study compared the effectiveness of Intensive Psychodynamic Therapy (IPT) and SPARS-based Emotion-Focused Cognitive-Behavioral Therapy (EF-CBT) on rumination and depression.

Materials and Methods: In this study, 60 infertile women in Tehran-Iran in 2024, were purposively sampled and randomly assigned to two intervention groups and a control group (20 each). The Nolen-Hoeksema Rumination Questionnaire and Beck Depression Inventory were used. IPT consisted of 8 group sessions (2/week, 60 min each), while EF-CBT based on the SPARS model consisted of 12 sessions (2/week, 60 min each). The control group was placed on a waiting list. Data were analyzed using ANCOVA, ANOVA, and t-tests.

Results: Significant differences were observed between the intervention groups and control in post-test scores of rumination ($P= 0.000$, $F= 175.118$) and depression ($P= 0.000$, $F= 61.57$). EF-CBT had a greater effect on rumination and depression than IPT.

Conclusion: Both SPARS-based EF-CBT and IPT effectively reduce rumination and depression in infertile women. Awareness and acceptance of basic emotions, cognitive restructuring, and emotional expression are key mechanisms. These interventions can be applied in infertility clinics and counseling centers.

Keywords: Depression, Emotion, Infertility, Psychodynamic therapy, Rumination

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*Corresponding Author:

Career Counseling Department, Faculty of Psychology, Neyshabur Branch, Islamic Azad University, Neyshabur, Iran.

ir.m.akbarzadeh@gmail.com

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Introduction

Infertility affects up to 19% of women who are actively trying to conceive in the United States (1). Infertile women often experience chronic stress, which can negatively impact their overall health (2). Infertility presents significant psychological challenges, particularly for women, leading to elevated levels of anxiety and depression (3). Various studies have shown that rumination has multiple adverse consequences, facilitating the development and persistence of depression and other psychological disorders (4). Rumination is generally defined as intrusive, repetitive, and uncontrollable negative thoughts that contribute to sustained distress and maladaptive outcomes following adverse events (5,6).

Several factors have been investigated in the treatment of depression and rumination among infertile women, among which cognitive strategies play a key role in the emergence, maintenance, and exacerbation of depressive and anxious symptoms (7). The intensive short-term psychodynamic approach, derived from Freudian psychoanalytic theory, was developed by the Iranian scholar Davanloo at McGill University. This approach transforms long-term psychoanalytic therapy into a brief, structured, and effective method (8). In this therapy, patients are assisted in regulating their anxiety and emotions and in working through defensive mechanisms, which, in turn, strengthens the self and enables engagement with previously avoided emotions (9). Intensive short-term psychodynamic interventions have been applied to address marital differentiation and attachment behaviors (9), existential compassion and anxiety among infertile individuals (10), distress tolerance and quality of life in infertile women (11), as well as sexual functioning in depressed women (12).

Today, Cognitive-Behavioral Therapy (CBT), as a widely applied psychotherapeutic approach, does not have a single unified definition and is not considered a single model of therapeutic intervention (13). In this context, Power and Dalgleish proposed a model based on contemporary cognitive approaches to emotion, known as the SPARS model, which encompasses four representational and processing systems—associative, linking, propositional, and schematic—that form two emotional generation pathways. The associative system consists of specific sensory inputs (visual, auditory, gustatory, olfactory,

tactile, and motor), the linking system operates automatically and includes intrinsic emotion triggers as well as learned systems, the propositional system requires processing through the linking or schematic systems to generate emotion, and the schematic system functions as a higher-level executive control, representing the self and the world. These four systems interact to shape emotional pathways (15). CBT interventions based on this model have been used to reduce infertility-related stress (16), anxiety (17), and to modify maladaptive attitudes and beliefs in infertile women.

Overall, research indicates that infertility in women can lead to social biases (18), psychological consequences (19), stress and anxiety (20), and emotional difficulties (21). To fully understand depression and rumination in infertile women, it is necessary to examine these phenomena at both intrapersonal and social levels. Incorporating a psychobehavioral approach into these perspectives can be beneficial for clinicians working with infertile women. Therefore, employing a multidisciplinary approach to treat depression and rumination is more appropriate for effectively addressing and resolving the complex nature of this distressing issue for women. Despite existing research on rumination and depression in infertile women, significant ambiguities and gaps remain regarding the improvement of these variables. Considering the importance of this issue, multiple factors influence depression and rumination in infertile women, making the use of an effective therapeutic approach indispensable. Since psychological difficulties are determined by various factors, accurate diagnosis and appropriate treatment are essential. Accordingly, this study was conducted to compare the effectiveness of intensive psychodynamic therapy and SPARS-based cognitive-behavioral therapy on rumination and depression in infertile women.

Materials and Methods

This study was conducted on infertile women referred to counseling and psychology centers in Tehran. Based on G*Power calculations ($\alpha=0.05$, effect size= 0.15), 60 eligible participants were selected through purposive sampling and randomly assigned to two intervention groups (Short-Term Intensive Psychodynamic Therapy and SPARS-based Emotion-Focused CBT and

one control group, with 20 participants each. Inclusion criteria included diagnosed infertility, willingness and ability to attend all sessions, consent to participate, and no concurrent interventions. Exclusion criteria included missing more than two sessions or failing to complete assignments. Ethical considerations included informed consent, confidentiality, and adherence to human research principles.

Research instruments

A) *Nolen-Hoeksema Rumination Questionnaire*: This tool with 22 items assesses reflection, brooding, and depression. Its psychometric indexes were acceptable in Iranian studies (Cronbach’s alpha= 0.88) (22).

B) *Beck Depression Inventory-II (BDI-II)*: This 21-item inventory assesses affect, cognition, behavior, somatic symptoms, and interpersonal signs. In Iranian populations, its Cronbach’s alpha reported as 0.87 (23).

STIPT: Based on Davanloo’s protocol (24), 8 group sessions (2/week, 60 min), focusing on anxiety regulation, emotional expression, defense modification, and insight development. SPARS-based EF-CBT: Based on Shamelı et al. (25), 12 group sessions (2/week, 60 min), targeting cognitive-emotional processes via four interconnected systems (analogical, associative, propositional, schematic) to reduce maladaptive emotional responses.

Pre-test administration using the questionnaires, followed by intervention sessions. All sessions were conducted by a licensed PhD psychologist and a doctoral student at a Tehran health center. Post-test assessments were completed immediately after interventions. Statistical analyses were conducted using SPSS 27. To test the study hypotheses, analysis of covariance (ANCOVA), analysis of variance (ANOVA), and t-tests were employed.

Table 1. Summary of short-term intensive psychodynamic therapy sessions (24)

Session	Focus	Homework
1	Session rules, initial assessment	Explore core intrapsychic problems, stress, and anxiety regulation
2	Interventions based on conflict and resistance levels	Challenge defenses, regulate anxiety
3	Identify emotional problems and defense mechanisms	Questioning and problem analysis
4	Facilitate emotional experience, monitor anxiety and defenses	Pressure and challenge defenses
5	Stepwise work on defenses for vulnerable patients	Confrontation and anxiety regulation
6	Transference emotions toward therapist	Identify, clarify, confront
7	Unlock unconscious material; reinforce emotional processing	Full emotional experience (cognitive, physiological, behavioral)
8	Integration of conflicting emotions (anger, guilt, love)	Cognitive, emotional, and behavioral interpretation

Table 2. Summary of emotion-focused cognitive-behavioral therapy based on the SPARS model (24)

Session(s)	Focus	Homework
1	Session overview, confidentiality, assessment, protocol introduction	Set life goals, list problems, daily mood monitoring
2	Strengthen therapeutic alliance, set therapy goals, mood improvement activities	Plan steps toward goals, enjoyable activities, daily mood chart
3	Meta-emotional skills: awareness, acceptance, nonjudgmental attention	Record weekly emotions, mindful breathing
4	Label and differentiate emotions; identify triggers and consequences	Daily mood chart, mindful walking
5	Components of emotional experience and interactions	Record emotional experiences, mindfulness practice
6	Emotion regulation strategies; internal-external and effective-ineffective regulation	Review avoidance behaviors, identify emotion regulation strategies
7	Role of thinking; cognitive traps	Study thoughts handout, complete emotion regulation table
8	Review emotions, beliefs, inhibitions; importance of emotion elicitation	Emotional Story Worksheet 1
9-11	Elicit and express emotions, access inhibited feelings, validate experiences	Emotional Story Worksheet 2
12	Review therapy concepts, assess current emotions, prepare for future application	Review session summary handout

Results

Table 4 reports the demographic findings of the study participants. Table 5 shows the mean and standard deviation of rumination and depression scores for the two short-term psychodynamic therapy and SPARS-based

emotion-focused CBT groups and the control group. The mean scores of dependent variables in pre-test and post-test in both experimental groups were significantly different, while this difference in the control group was not significant.

Table 4. Demographic findings by experimental and control groups

Variable	Frequency of emotion-focused CBT based on SPARS model	Frequency of short-term psychodynamic therapy	Frequency of control
Age			
Under 20 years	1 person	0 person	0 person
20 to 30 years	7 persons	8 persons	10 persons
Above 30 years	12 persons	11 persons	10 persons
Education			
Below Diploma	5 persons	4 persons	6 persons
Diploma	8 persons	5 persons	5 persons
Bachelor	5 persons	7 persons	7 persons
Master's and above	2 persons	4 persons	2 persons

Table 5. Descriptive statistics of pre-test and post-test scores by experimental and control groups

Component	Group	Descriptive index	Stage	Within-group changes	Between-group changes P
Rumination	Short-term psychodynamic therapy	Mean ± SD	Pre-test	3.63 ± 3.89	
			Post-test	2.38 ± 4.67	0.000
			Skewness-Kurtosis	-0.24 -0.65	-0.03 -0.87
	SPARS-based emotion-focused CBT	Mean ± SD	Pre-test	3.11 ± 3.62	
			Post-test	2.45 ± 4.43	
			Skewness-Kurtosis	-0.2 -0.78	-0.21 -0.49
Depression	Short-term psychodynamic therapy	Mean ± SD	Pre-test	4.56 ± 6.45	0.000
			Post-test	3.85 ± 7.09	
			Skewness-Kurtosis	-0.94 -0.06	-0.01 -1.51
	SPARS-based emotion-focused CBT	Mean ± SD	Pre-test	5.56 ± 5.17	
			Post-test	4.35 ± 4.47	
			Skewness-Kurtosis	-0.31 -1.32	-0.76 -0.37
Control	Mean ± SD	Pre-test	5.56 ± 3.89		
		Post-test	5.57 ± 3.84		
		Skewness-Kurtosis	-0.24 -0.65	-0.13 -7.76	

Test: ANCOVA * $P \leq 0.01$

The results of Table 6 indicate significant differences between short-term psychodynamic therapy, SPARS-based emotion-focused CBT,

and the control group in the post-test scores of rumination ($F= 175.118, P= 0.000$) and depression ($F= 61.57, P= 0.000$). The effect

size of these two interventions for rumination and depression was 0.45 and 0.31, respectively. The t-test results in Table 7 indicate a significant difference between the short-term psychodynamic therapy and control groups in post-test rumination scores ($F= 0.011, P=$

0.000). Also, there was a significant difference between the two groups in post-test depression scores ($F= 22.22, P= 0.000$). The mean differences of -23.7 and -19.45 indicate a greater effect of short-term psychodynamic therapy on rumination and depression.

Table 6. Analysis of the differences in post-test scores of rumination and depression among the first and second intervention groups and the control group

Variable	Source of variation	Sum of Squares	df	Mean Square	F	P	Effect size
Rumination	Within groups	7115.033	2	3557.517	175.118	0.000	0.45
	Between groups	1157.950	57	20.315			
	Total	8272.983	59				
Depression	Within groups	3791.033	2	1895.517	61.57	0.000	0.31
	Between groups	1875.300	57	32.900			
	Total	5666.333	59				

Table 7. Differences in post-test scores of rumination and depression between short-term psychodynamic therapy group and control group

Variable	t-value	df	F	P	Mean Difference
Rumination	-16.48	38	0.011	0.000	-23.7
Depression	-9.8	38	22.22	0.000	-19.45

The results of ANOVA and t-test in Table 8 indicate a significant difference in rumination between short-term psychodynamic therapy and SPARS-based emotion-focused CBT in post-test scores ($F=0.13, P= 0.000$). Also, there was no significant difference in depression between the two intervention groups in post-test scores ($F= 15.42, P= 0.39$). The mean differences were -1.25 and -5.10, respectively. The results of ANOVA and t-test in Table 9 indicate a significant difference in rumination between SPARS-based emotion-focused CBT and the control group in post-test scores ($F=$

0.26, $P= 0.000$). Also, there was a significant difference in depression between SPARS-based emotion-focused CBT and the control group ($F= 0.25, P= 0.000$). The mean differences of 22.45 and 8.95 indicate the greater effectiveness of SPARS-based emotion-focused CBT on rumination and depression in post-test. Comparison of the mean differences in Tables 7 and 9 shows that SPARS-based emotion-focused CBT had a greater effect on rumination and depression (mean differences= 22.45 and 8.95) compared to short-term psychodynamic therapy.

Table 8. Differences in post-test scores of rumination and depression between the first and second intervention groups

Variable	t-value	df	F	p-value	Mean Difference
Rumination	-0.86	38	0.13	0.000	-1.25
Depression	-5.12	38	15.42	0.39	-5.10

Table 9. Differences in post-test scores of rumination and depression between SPARS-based emotion-focused CBT and control group

Variable	t-value	df	F	P	Mean Difference
Rumination	16.05	38	0.26	0.000	22.45
Depression	6.78	38	0.25	0.000	8.95

Discussion

This study aimed to compare the effectiveness of intensive psychodynamic therapy and SPARS-based emotion-focused cognitive-behavioral therapy on rumination and depression in infertile women. The present study results

showed that schema-based emotion-focused cognitive-behavioral intervention based on the SPARS model had a greater effect on rumination and depression compared to short-term psychodynamic therapy.

The findings of this study are consistent with the results of Hassannejad (2), Alirahmi (26), Alipanah (27), Shameli (25), Foroudifard (7), Wang et al. (28), and Kheirkhah et al. (29), as all emphasize the effect of cognitive, emotion-focused, and schema-based approaches on reducing rumination, depression, and enhancing mental health. Comparison with related studies shows that some studies, such as Hassannejad and Foroudifard, although having a similar population (infertile women), used different interventions (mindfulness and cross-sectional study) and other measurement tools. Studies such as Shameli and Alipanah, although using similar interventions (SPARS model and schema therapy), had a different population and measured depression, negative affect, or resilience with different tools. Furthermore, studies like Alirahmi, despite using similar tools for depression and rumination, employed a different intervention method and type of therapy. Therefore, differences in therapeutic approach, tools, and research method explain the relative heterogeneity of results. In explaining the discrepancy of findings with the mentioned studies, it should be noted that the sample of some studies did not include infertile women, and none of these studies simultaneously examined the effect of short-term psychodynamic therapy on both rumination and depression.

In explaining the findings of this part of the present study, it is stated that psychological distress in infertile women is similar to that in chronic patients and is influenced by biological, psychological, and social factors. Adaptive coping strategies, such as problem-solving and social support, improve mental health, whereas maladaptive strategies, such as avoidance and self-blame, exacerbate anxiety and depression. Prolonged infertility is also associated with increased psychological harm and emphasizes the necessity of timely intervention and support (3). The SPARS model, with two conscious (schematic) and unconscious (associative) pathways in emotion generation, and focus on five basic emotions including sadness, anger, anxiety, disgust, and joy, explains the formation and disruption of emotions (25,30,31). This model provides a basis for understanding and treating emotional problems. In the present study, SPARS-based emotion-focused cognitive-behavioral therapy, by increasing awareness of basic emotions, accepting positive and negative feelings, cognitive restructuring,

and reducing behavioral avoidance, improved emotion regulation and reduced depression and rumination in infertile women. The flexibility of this model makes it an effective and applicable approach for vulnerable groups, including infertile women.

Furthermore, in the present study, short-term intensive psychodynamic therapy, by providing an opportunity for emotional expression and anxiety regulation, helped infertile women to identify their internal conflicts and suppressed emotions and, through conscious experience of emotions, to change negative thought patterns associated with failure. This approach, by increasing insight into self and relationships, reducing fear of worthlessness, and understanding the emotional roots of rumination, reduced depression and improved mental health, and can be effective in treating and preventing rumination and depression in infertile women.

The present study has several limitations that should be noted. First, it was a single-center study that only included infertile women. Second, the sample size was relatively small. Therefore, the generalizability of the findings may be limited to the characteristics of our study sample.

It is recommended that the present study be conducted separately for each variable of rumination and depression. By understanding the broad mental health consequences of infertility, stakeholders can be better prepared to address these psychological challenges, ultimately improving the quality of life and emotional well-being of infertile women. This study, by emphasizing the importance of psychological considerations in managing the mental health of infertile women, serves as a vital resource for psychiatrists, psychologists, and mental health policymakers.

Conclusion

Depression and rumination were among the variables affected by SPARS-based emotion-focused cognitive-behavioral therapy and short-term intensive psychodynamic therapy, and these interventions had a positive and significant effect on depression and rumination in infertile women.

According to the results of the present study, it can be concluded that by regulating anxiety and examining the emotions of infertile women, they can achieve a deep understanding of their emotions, and stopping negative thoughts will lead to a reduction in depression and rumination

symptoms. Furthermore, awareness of basic emotions and acceptance of positive and negative emotions created an opportunity for infertile women to be prepared to cope with challenges, and by focusing on cognitive restructuring and stopping negative thoughts, their rumination and depression can be alleviated.

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Conflict of Interests

The authors declare no conflict of interest.

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Ethical Considerations

Participants were informed of their right to withdraw, and all ethical guidelines were strictly followed.

Authors' Contribution

All authors contributed equally to the conduct of this study.

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