

The Efficacy of Acceptance and Commitment Therapy on Self-Compassion, Cognitive Flexibility, and Infertility-Related Stress Among Infertile Women: A Quasi-Experimental Study

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Abstract

Introduction: Infertility significantly impacts women's psychological well-being, often leading to increased emotional distress and infertility-related stress. Acceptance and Commitment Therapy (ACT) is a promising psychological approach that may facilitate adaptive coping mechanisms in this population. This study was conducted to assess whether cognitive flexibility and self-compassion can be effectively improved by ACT while reducing infertility-related stress among infertile women.

Methods: This quasi-experimental study with a control group and pre-test–post-test design included 36 infertile women selected through convenience sampling from infertility centers in Rasht, Iran, in 2024. Participants were randomly assigned to two groups (n=18 each): a control group and an experimental group. No intervention was provided to the control group, whereas the experimental group participated in weekly ACT sessions (8 sessions, 90 minutes each). The Self-Compassion Scale (SCS), the Cognitive Flexibility Inventory (CFI), and the Fertility Problem Inventory (FPI) were used to collect data. Multivariate Analysis of Covariance was used for statistical analysis in SPSS version 28.

Results: After the intervention, the intervention group showed significant increases in self-compassion and cognitive flexibility and a significant reduction in infertility-related stress compared with the control group (all $P < 0.001$). MANCOVA confirmed that between-group differences in self-compassion were significant ($F = 85.87$, $\eta^2 = 0.73$), cognitive flexibility ($F = 48.86$, $\eta^2 = 0.61$), and infertility-related stress ($F = 63.96$, $\eta^2 = 0.67$) (all $P < 0.001$).

Conclusion: ACT is an effective psychological intervention for improving adaptive psychological functioning in infertile women. By fostering self-compassion and cognitive flexibility and mitigating infertility-related stress, ACT can promote emotional adjustment. These results suggest that integrating ACT-based interventions into routine infertility care may yield significant clinical benefits.

Keywords: Acceptance and Commitment Therapy, self-compassion, Cognitive flexibility, Infertility-related stress

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Introduction

Infertility is widely recognized as a major life crisis that affects not only biological functioning but also the emotional, relational, and social well-being of couples (1). For many women, the inability to conceive challenges deeply held beliefs about femininity, identity, and life purpose, and is often experienced as a profound personal and marital loss (2). In many cultural contexts, motherhood is considered a central marker of womanhood, which may intensify feelings of stigma, guilt, and inadequacy when pregnancy is not achieved (3). Consequently, women facing

infertility are at heightened risk for psychological issues, such as anxiety, depressive symptoms, and reduced quality of life (4).

Infertility, as a chronic and often unpredictable life stressor, profoundly disrupts women's emotional equilibrium and sense of self (5). Self-compassion has emerged as a critical psychological resource for women coping with infertility, a condition often accompanied by pervasive feelings of inadequacy, shame, and self-blame (6). Women experiencing infertility tend to evaluate themselves harshly, internalize societal expectations



surrounding motherhood, and interpret reproductive difficulties as personal failure (7). Self-compassion, which entails self-kindness, mindful awareness of emotional pain, and recognition of shared human suffering, provides a protective mechanism against these maladaptive responses (8). Research indicates that higher levels of self-compassion are associated with lower depressive symptoms, reduced anxiety, and improved emotional well-being among infertile individuals (9).

In addition to emotional resources such as self-compassion, cognitive processes play a central role in women's psychological adjustment to infertility (10). Shifting perspectives, reframing adverse experiences, and adaptively modifying thought patterns, cumulatively known as cognitive flexibility, play a crucial role in how women psychologically process infertility (11). Infertility often triggers rigid, negative, and repetitive cognitions, all of which exacerbate emotional distress (12). Women with higher cognitive flexibility are more capable of reframing infertility not as a fixed identity marker but as a challenge that can be managed through medical, psychological, or relational strategies (13). Studies have shown that greater cognitive flexibility predicts better coping skills, reduced rumination, and enhanced problem-solving abilities in women undergoing fertility treatment (14).

Infertility-related stress represents one of the most significant emotional burdens encountered by women facing reproductive difficulties (15). This form of stress arises from various sources, including diagnostic uncertainty, invasive medical procedures, societal and familial expectations, financial pressures, and the perceived loss of control over one's reproductive future (16). Research consistently shows that women experience infertility as a gendered stressor, often reporting higher psychological strain than their male partners due to cultural norms linking femininity to motherhood (17). Elevated infertility-related stress is associated with heightened anxiety, depressive symptoms, relationship dissatisfaction, and diminished quality of life (18).

One of the most recent third-wave cognitive-behavioral interventions is Acceptance and Commitment Therapy (ACT), which conceptualizes psychological suffering as arising primarily from experiential avoidance and cognitive fusion with distressing internal events (19). Instead of attempting to modify dysfunctional thoughts directly, ACT seeks to enhance psychological flexibility, defined as the capacity to remain in mindful contact with the present moment while pursuing behavior that is congruent with personally held values, even in the presence of emotional pain (20, 21). Within the context of infertility, ACT helps women and couples to openly acknowledge and accept feelings of grief, shame, uncertainty, and perceived failure, without engaging in maladaptive control strategies such as excessive rumination, social withdrawal, or rigid fixation on treatment outcomes (22, 23).

Through core processes including acceptance, mindfulness, cognitive defusion, and values-based action, ACT is posited to cultivate a more compassionate stance

toward the self in the face of reproductive difficulties, thereby fostering greater self-compassion (24). Furthermore, by encouraging flexible perspective-taking and alternative ways of responding to infertility-related thoughts and emotions, ACT may directly strengthen cognitive flexibility and attenuate infertility-related stress (25). Consequently, ACT represents a theoretically grounded and empirically promising approach for improving emotional adjustment and overall psychological well-being in women and couples struggling with infertility (26). Infertility imposes substantial psychological distress, underscoring the need for effective interventions that foster adaptive emotional and cognitive coping (27). ACT offers a promising psychological approach that aims to enhance overall mental well-being by fostering adaptive emotional regulation, promoting flexible cognitive responding, and reducing the psychological burden associated with challenging life experiences such as infertility (28).

Although ACT has demonstrated effectiveness in improving psychological flexibility and reducing emotional distress across various clinical populations, empirical evidence regarding its specific application among infertile women remains limited. Given the complex psychological burden associated with infertility, including heightened self-criticism, cognitive rigidity, and infertility-related stress, identifying effective psychological interventions is of considerable importance. Moreover, research simultaneously examining the possible applications of ACT in improving self-compassion, cognitive flexibility, and infertility-related stress within this population is scarce. Therefore, the present study investigated the application of ACT in enhancing cognitive flexibility and self-compassion while reducing infertility-related stress among women experiencing infertility.

Methods

A quasi-experimental pretest-posttest design with convenience sampling and random allocation to intervention and control groups was employed.

The target population consisted of 70 infertile women attending infertility treatment centers in Rasht in 2024. Using convenience sampling, 36 participants with a confirmed diagnosis of infertility by an obstetrics and gynecology specialist were recruited based on the inclusion criteria. After enrollment and baseline assessment, participants were randomly assigned to the experimental or control group ($n = 18$ per group) using a simple lottery method. Specifically, each participant was assigned a unique identification code, which was written on a slip of paper and placed in a sealed container. The slips were thoroughly mixed, and the participants' codes were then drawn by an independent researcher not involved in the intervention. The experimental group received the first 18 selected codes, and the control group received the remaining 18.

Eligibility criteria included a confirmed diagnosis of infertility by a specialist physician, being within reproductive age (18–45 years), willingness to participate and provide informed consent, and the ability to read,

understand, and complete the study questionnaires. Participants were excluded if they had severe psychiatric disorders (e.g., psychotic disorders or major depressive disorder) based on self-report or clinical records, were concurrently receiving other psychological or counseling interventions, initiated psychiatric medication during the study period, were absent from more than two intervention sessions, or withdrew from the study.

Outcome measures

The study outcomes were assessed using standardized self-report questionnaires administered at baseline (pre-test) and immediately after completion of the intervention (post-test). The primary outcome was infertility-related stress, assessed using the Fertility Problem Inventory (FPI). The secondary outcomes were self-compassion and cognitive flexibility, measured using the Self-Compassion Scale-Short Form (SCS-SF) and the Cognitive Flexibility Inventory (CFI), respectively. All instruments have validated Persian versions with acceptable psychometric properties and were administered under standardized conditions.

Measurement tools

The Self-Compassion Scale (SCS)

was developed by Neff in 2003, and the short form consists of 12 items (29). This questionnaire assesses self-compassion across six bipolar dimensions, including self-kindness versus self-judgment, common humanity versus isolation, and mindfulness versus over-identification. A 5-point Likert scale ranging from 1 to 5 (rarely to almost always) was used to rate the items. Over-identification, isolation, and self-judgment (items with negative wording) are reverse-scored in the total score calculation. The total score is the sum of all item scores and ranges from 12 to 60; higher scores indicate greater self-compassion. Neff reported a reliability coefficient of 0.93 for the Self-Compassion Scale. Cronbach's alpha coefficients have also been reported as 0.95 in the United States and 0.86 in Thailand (29). The translated, culturally adapted, and psychometrically validated Persian version of the Self-Compassion Scale has demonstrated acceptable validity and reliability in Iranian populations (30). In the current study, the Cronbach's alpha coefficients for the dimensions of mindfulness versus over-identification, common humanity versus isolation, and self-kindness versus self-judgment were 0.83, 0.80, and 0.72, respectively.

Dennis and Vander Wal (31) developed the Cognitive Flexibility Inventory (CFI) to assess cognitive flexibility, defined as the ability to identify, challenge, and replace maladaptive or incompatible thoughts with more balanced and adaptive alternatives. The questionnaire uses a 7-point Likert scale (1-7; strongly disagree to strongly agree) to rate 20 items. It has two subscales: perception of controllability and perception of alternative options. The total score is the sum of all item scores (range: 20–140); higher scores indicate greater cognitive flexibility. The original developers reported Cronbach's alpha coefficients of 0.91 for the total scale, 0.84 for perception of controllability, and 0.91 for

perception of alternative options, with test-retest reliability coefficients of 0.81, 0.77, and 0.75, respectively (31). The Persian version of this questionnaire has previously been translated, culturally adapted, and psychometrically validated in Iran, demonstrating acceptable validity and reliability among Iranian populations (32). In the current study, the reliability of the Persian version was re-evaluated using Cronbach's alpha, yielding a coefficient of 0.89.

The Fertility Problem Inventory (FPI)

was developed by Newton et al. (33) to assess stress associated with infertility. This instrument consists of 46 items evaluating infertility-related stress across five subscales: rejection of a childfree lifestyle, need for parenthood, relationship concern, sexual concern, and social concern. The inventory uses a 6-point Likert scale ranging from 1 to 6 (strongly disagree to strongly agree), with 13 reverse-scored items. The total score is the sum of all item responses and ranges from 46 to 276; higher scores indicate greater infertility-related stress. Newton et al. reported satisfactory psychometric properties for the inventory (33). The Persian version of the Fertility Problem Inventory has previously been translated, culturally adapted, and psychometrically validated in Iran, demonstrating acceptable validity and reliability among Iranian populations (34). The Cronbach's alpha coefficient of 0.92 confirmed acceptable internal consistency for the questionnaire.

Intervention

Acceptance and Commitment Therapy (ACT)

After participants were assigned to the experimental and control groups, pre-tests were administered to all participants. Due to the psychological sensitivity and specific challenges faced by infertile women, all data were collected through in-person sessions to ensure accuracy and rapport. The experimental group received eight weekly 90-minute group sessions of ACT, facilitated by a therapist specializing in behavioral interventions at a psychology clinic. Meanwhile, the control group received no intervention during the study period and was kept on a waitlist. Participants were asked to avoid discussing intervention details with one another to prevent diffusion of treatment (cross-group contamination). This measure helped maintain group integrity, and notably, no attrition (participant dropout) occurred during the intervention. The ACT protocol was implemented based on the established framework by Hayes et al. (35), incorporating the core processes of the ACT model (see Table 1). The same therapeutic program was offered to the control group in accordance with ethical standards to ensure equitable access to treatment. This was done after post-test assessments were completed.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 28. Descriptive statistics (mean and standard deviation) were used to summarize the data. Levene's test and Shapiro–

Wilk test were used to assess the homogeneity of variances and normality of distribution, respectively. To compare pre-test scores and baseline characteristics between groups, independent-samples *t*-tests were used. In contrast, within-group changes from pre-test to post-test were examined using paired-samples *t*-tests. Multivariate analysis of covariance (MANCOVA) was performed to compare post-test scores between groups while controlling for pre-test values. The significance level was set at $P < 0.05$.

Result

The mean $\pm$ SD of age was 33.10 ± 5.72 for the control group and 32.87 ± 5.63 for the experimental group. No significant differences between the control and experimental groups regarding duration of infertility, age group, and education level were indicated by the chi-square test ($P > 0.05$) (Table 2).

The mean $\pm$ SD of pre-test and post-test scores for self-compassion, cognitive flexibility, and infertility-related stress in the intervention and control groups are presented in Table 3. Independent-samples *t*-tests showed no significant differences between the two groups at pre-test in self-compassion ($P = 0.218$), cognitive flexibility ($P = 0.302$), or infertility-related stress ($P = 0.247$), indicating baseline

comparability. Using paired-samples *t*-tests, significant within-group changes were identified in the intervention group following the intervention. Self-compassion and cognitive flexibility increased significantly ($P = 0.001$), while infertility-related stress significantly decreased ($P = 0.001$). No significant changes were noticed in the study variables in the control group ($P > 0.05$). In addition, between-group post-test comparisons showed significant differences across all variables ($P = 0.001$), confirming the intervention's effectiveness.

Levene's test for homogeneity of variance for the dependent variables across groups indicated equal variances in infertility-related stress, cognitive flexibility, and self-compassion across groups ($P > 0.05$). The equality of the covariance matrices of the dependent variables between the control and experimental groups was assessed using the Box test, indicating equal covariance matrices (Box $M = 44.81$, $F = 1.52$, $P > 0.309$). The Box test was not significant ($P > 0.05$), confirming the validity of this assumption. Also, the chi-square-Bartlett test results examining the sphericity and significance of the relationship among self-compassion, cognitive flexibility, and infertility-related stress confirmed that the relationship is significant ($\chi^2 = 102.40$, $df = 21$, $P < 0.05$).

Table 1. Summary of Sessions Based on the ACT Protocol

Session	Therapeutic focus	Session content	Expected outcomes
1	Introduction to ACT	Establishing rapport, group rules, therapeutic goals, introduction to the ACT model, and treatment expectations	Participants become familiar with the ACT approach and its process.
2	Creative hopelessness and experiential avoidance	Exploring ineffective coping strategies, experiential avoidance, cognitive fusion, and the costs of emotional control	Increased awareness of the limitations of avoidance and willingness to experience emotions.
3	Cognitive diffusion	Teaching cognitive diffusion techniques through metaphors and experiential exercises, distinguishing thoughts from facts	Reduced attachment to distressing thoughts and improved psychological distance.
4	Acceptance and present-moment awareness	Mindfulness exercises, acceptance of internal experiences, observing thoughts and emotions without judgment	Greater acceptance of difficult emotions and increased present-moment awareness.
5	Self-as-context	Developing the observing self through mindfulness and perspective-taking exercises	Enhanced psychological flexibility and reduced identification with distressing experiences.
6	Value clarification	Identifying personally meaningful life values and recognizing barriers to value-based living	Increased clarity regarding personal values and life direction.
7	Committed action	Goal setting, behavioral commitment, overcoming obstacles, and practicing value-consistent behaviors	Increased commitment to valued actions and adaptive coping behaviors.
8	Review and consolidation	Reviewing ACT skills, relapse prevention, integrating ACT strategies into daily life, and providing feedback	Maintenance of psychological flexibility and continued application of ACT skills.

Table 2. Demographic characteristics of the participants in the intervention and control groups

Variables	Intervention group <i>n</i> (%)	Control group <i>n</i> (%)	<i>P</i> -value
Age			0.179
23–29	6 (33.4%)	7 (38.9%)	
30–40	12 (66.6%)	11 (61.1%)	
Duration of infertility			0.201
2–5 years	10 (55.6%)	11 (61.1%)	
6–9 years	8 (44.4%)	7 (38.9%)	
Educational level			0.110
High school	4 (22.2%)	4 (22.2%)	
Bachelor's degree	9 (50.0%)	10 (55.6%)	
Master's or higher	5 (27.8%)	4 (22.2%)	

Table 3. Descriptive indices of the study's variables in the experimental and control groups

Variables	Group	Pre-test	Post-test	<i>p</i> ^y
Self-compassion	Intervention	35.56 $\pm$ 2.63	43.48 $\pm$ 3.63	0.001
	Control	36.11 $\pm$ 5.33	34.12 $\pm$ 2.82	0.695
	<i>p</i> ^z	0.218	0.001	
Cognitive flexibility	Intervention	65.67 $\pm$ 2.72	71.72 $\pm$ 4.09	0.001
	Control	66.39 $\pm$ 2.99	64.10 $\pm$ 3.14	0.454
	<i>p</i> ^z	0.302	0.001	
Infertility-related stress	Intervention	91.62 $\pm$ 2.01	84.83 $\pm$ 3.63	0.001
	Control	90.88 $\pm$ 4.24	92.55 $\pm$ 1.82	0.518
	<i>p</i> ^z	0.247	0.001	

Values are mean $\pm$ SD, *p*^y: from within-group comparison, *p*^z: from between-group comparison

The relationships between the independent variable (intervention method) and the dependent variables were tested using pre- and post-tests to assess homogeneity of regression coefficients. No significant interaction between the pre-tests and post-tests and the independent variable was found, indicating homogeneity of regression slopes. Thus, all assumptions of multivariate analysis of covariance were satisfied.

The results of the comparison between the two groups using multivariate analysis of covariance are presented in Table 4. A significant difference was observed between the groups in self-compassion ($F=85.87$), cognitive flexibility ($F=48.86$), and infertility-related stress ($F=63.96$) at the 0.001 level, based on the marginal post-test score adjusted for baseline covariates.

Discussion

This study assessed the effectiveness of ACT in the improvement of self-compassion, cognitive flexibility, and infertility-related stress among women experiencing infertility. The findings of the present study demonstrated that ACT significantly increased self-compassion and cognitive flexibility while reducing infertility-related stress among women in the experimental group.

The results of the present study indicated that participation in ACT led to a significant increase in self-compassion among women experiencing infertility. Women facing infertility often experience intense feelings of self-blame, shame, and perceived inadequacy, which can undermine their emotional well-being and contribute to negative self-evaluation (20). ACT appears to help individuals develop a more compassionate and accepting stance toward themselves by encouraging openness to difficult emotional experiences rather than avoidance or self-judgment (22). Theoretically, this improvement can be understood through several core processes emphasized in ACT, particularly acceptance, mindfulness, and self-as-context. Using experiential techniques and mindfulness-based exercises, participants learn to observe their thoughts and emotions without over-identifying with them (19). This process reduces harsh self-criticism and facilitates a more balanced and supportive internal dialogue (35). As individuals recognize that painful thoughts and feelings are natural parts of human experience rather

than personal failures, they become better able to respond to themselves with understanding and kindness (25). Furthermore, ACT promotes psychological flexibility by helping individuals detach from rigid self-narratives that may arise in the context of infertility, such as beliefs about personal inadequacy or failure (21). By learning to relate differently to these internal experiences, women may become less entangled in self-critical thinking and more open to treating themselves with compassion (18). This shift in perspective fosters emotional resilience and helps individuals maintain a supportive relationship with themselves, even in the face of ongoing reproductive challenges (26).

The findings also revealed that Acceptance and Commitment Therapy significantly enhanced cognitive flexibility among women experiencing infertility. Infertility often leads individuals to develop rigid and repetitive patterns of thinking, such as catastrophizing, hopelessness, or all-or-nothing interpretations about the future. These cognitive patterns can intensify emotional distress and limit individuals' ability to adapt to the uncertainties associated with infertility (28). ACT interventions are specifically designed to help individuals develop greater flexibility in how they respond to internal experiences (21). One key mechanism underlying this effect is cognitive defusion, a central process within ACT that encourages individuals to view their thoughts as transient mental events rather than absolute truths (35). Through exercises and metaphors commonly used in ACT, participants learn to create psychological distance from distressing thoughts related to infertility. This shift allows them to disengage from rigid cognitive patterns and consider alternative interpretations and responses to challenging situations (23). Moreover, ACT emphasizes present-moment awareness and values-guided action, which further supports cognitive flexibility. By focusing attention on the present rather than becoming trapped in repetitive worries about the past or future, individuals develop a broader, more adaptive perspective on their circumstances (19). As a result, women experiencing infertility may become better able to adjust their thinking patterns, respond more adaptively to stressors, and pursue meaningful life goals despite ongoing reproductive difficulties (24).

The results of the present study also demonstrated that Acceptance and Commitment Therapy significantly reduced infertility-related stress among the participants. Infertility-related stress is a multifaceted construct that encompasses emotional distress, social pressure, marital strain, and concerns related to personal identity and life expectations (18). Women facing infertility frequently experience persistent psychological pressure due to treatment uncertainties, societal expectations, and concerns about motherhood. These stressors can significantly impair psychological well-being and overall quality of life (20). ACT may reduce infertility-related stress by encouraging individuals to accept rather than struggle against painful internal experiences associated with infertility (25). Instead of attempting to control or suppress distressing thoughts

Table 4. Comparison of post-test marginal mean scores between the two groups

Dependent variable	Group	Marginal mean	95% CI	F	P	Eta square
Self-compassion	Intervention	84.45	81.99 – 84.90	85.87	<0.001	0.73
	Control	74.05	72.59 – 75.50			
Cognitive flexibility	Intervention	71.80	70.21 – 73.40	48.86	<0.001	0.61
	Control	64.02	62.43 – 65.62			
Infertility-related stress	Intervention	84.78	83.37 – 86.18	63.96	<0.001	0.67
	Control	92.61	91.20 – 94.01			

CI: confidence interval

and emotions, participants are guided to acknowledge these experiences with openness and willingness. This shift reduces the psychological burden of constant efforts to avoid or control distress, promoting greater emotional balance (27). In addition, ACT helps individuals reconnect with their personal values and engage in meaningful life activities despite ongoing challenges (28). By focusing on valued directions in life rather than becoming overwhelmed by infertility-related concerns, individuals can develop a stronger sense of purpose and agency. This values-oriented approach allows women to broaden their sense of identity beyond the infertility experience, which in turn contributes to reduced stress and improved psychological adjustment (35).

While this study provides valuable insights, several limitations should be acknowledged. First, the quasi-experimental design limits the ability to draw definitive causal inferences. Second, as there were no long-term follow-ups, the durability of the intervention's effects was not evaluated. Third, the relatively small sample size may have limited the study's statistical power and the generalizability of the findings. In addition, the study was conducted at a single infertility center in a single city, which may further limit the external validity of the results, as the broader population of infertile women from diverse sociodemographic and cultural backgrounds may not have been represented.

Future studies could strengthen these findings by employing larger, multicenter samples across diverse geographic regions. Through longitudinal designs, the sustainability of therapeutic effects may be better assessed. At a clinical level, the significant impact of ACT on self-compassion and cognitive flexibility suggests that this approach should be integrated into routine infertility care protocols. It is recommended that infertility clinics move beyond purely medical treatments and incorporate multidisciplinary teams, including ACT-trained psychologists, to address the emotional burden of infertility. Specifically, specialized ACT-based workshops could be designed for infertile women to enhance their psychological resilience and reduce treatment-related stress. Furthermore, future research should explore the efficacy of online or digital ACT interventions, which could provide more accessible and cost-effective support for women who may face geographical or financial barriers to attending in-person sessions.

Conclusion

The results presented compelling evidence that ACT can effectively transform the psychological landscape of women facing infertility. By simultaneously fostering self-compassion, enhancing cognitive flexibility, and alleviating infertility-related stress, ACT equips this population with a robust framework for emotional resilience. The findings highlight that the core processes of ACT—moving from cognitive rigidity to psychological flexibility—are not merely theoretical but serve as potent clinical tools for navigating the profound distress of fertility challenges.

These results advocate for a paradigm shift in infertility care: transitioning from a purely medical model to a multidisciplinary, holistic approach. Integrating ACT-based interventions into routine clinical practice can bridge the gap between physical treatment and psychological well-being, ultimately fostering a higher quality of life and more adaptive adjustment for women throughout their infertility journey.

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Competing Interests

The authors declare no conflicts of interest related to this study.

Ethical Approval

The Ethics Committee of the Islamic Azad University, Rasht Branch, approved this study (approval code: IR.IAU.RASHT.REC.1403.054).

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Informed Consent

All participants provided written informed consent before enrollment in the study. Participants were informed about the study objectives, procedures, the voluntary nature of participation, confidentiality of their information, and their right to withdraw from the study at any time without any consequences.

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