

Predicting Psychological Distress Based on Psychological Flexibility, Attachment Needs, and Alexithymia in Infertile Women Following Unsuccessful IVF

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ABSTRACT

Objective: The present study aimed to predict psychological distress based on psychological flexibility, attachment needs, and alexithymia among infertile women who had experienced unsuccessful in vitro fertilization (IVF).

Methods and Materials: This quantitative, cross-sectional, descriptive-correlational study was conducted using structural equation modeling. The statistical population comprised infertile women receiving treatment in infertility centers in Shiraz, Iran, during 2025–2026 who had experienced at least one unsuccessful IVF cycle. A total of 280 eligible women were selected through purposive non-probability sampling. Data were collected using the Depression Anxiety Stress Scales-21 (Lovibond & Lovibond, 1995), Cognitive Flexibility Inventory (Dennis & Vander Wal, 2010), Marital Attachment Needs Scale (Samani et al., 2023), and Toronto Alexithymia Scale-20. Data were analyzed using Pearson correlations and structural equation modeling with SPSS 26 and AMOS 24.

Findings: Structural analyses showed that psychological flexibility significantly predicted psychological distress ($\beta = .58, p < .001$). Attachment needs were also a significant predictor of psychological distress ($\beta = .48, p < .001$). In addition, alexithymia significantly predicted psychological distress ($\beta = .43, p < .001$). Correlation analysis further showed significant associations between psychological distress and psychological flexibility ($r = -.17, p < .01$), attachment needs ($r = -.47, p < .05$), and alexithymia ($r = .65, p < .01$).

Conclusion: Psychological flexibility, attachment needs, and alexithymia are important psychological factors associated with distress following unsuccessful IVF. Assessment of these variables may help identify women at greater psychological risk and support the development of targeted psychological interventions alongside infertility treatment.

Keywords: *Psychological Distress; Psychological Flexibility; Attachment Needs; Alexithymia; Infertility; Unsuccessful IVF.*

1. Introduction

Infertility is a significant reproductive health challenge that extends beyond the inability to achieve pregnancy and affects multiple dimensions of individual, relational, and social functioning. For many women, infertility is experienced not simply as a medical diagnosis but as a prolonged life stressor involving repeated uncertainty, disruption of anticipated life plans, social pressure, concerns about identity and femininity, and fear regarding the possibility of future parenthood. Systematic evidence indicates that infertility is associated with substantial psychological consequences for women across different cultural and socioeconomic contexts, with anxiety, depressive symptoms, stress, impaired quality of life, and difficulties in coping frequently reported among affected populations (Nik Hazlina et al., 2022). These psychological consequences may be particularly pronounced in social environments where motherhood is strongly connected with women's expected familial and social roles. Accordingly, infertility can become a multidimensional crisis in which biological difficulties interact with psychological vulnerability, marital relationships, social expectations, and treatment-related uncertainty.

Evidence from different populations confirms that women experiencing infertility are at increased risk of common mental health problems. In a study of infertile women in North India, clinically relevant mental disorders and emotional symptoms were frequently observed, demonstrating that infertility may be accompanied by considerable psychiatric vulnerability (Kamboj et al., 2023). Similarly, research examining depression, anxiety, quality of life, and coping among women with infertility has demonstrated that emotional symptoms can coexist with impaired functioning and difficulties in adaptive coping (Dadhwaj et al., 2022). Studies of women receiving infertility treatment have likewise identified substantial rates of anxiety and depression and have shown that psychological symptoms may vary according to treatment characteristics, personal circumstances, and reproductive history (Wang et al., 2023). These findings indicate that psychological distress represents a clinically important component of infertility rather than a secondary or incidental response to reproductive difficulties.

The psychological burden of infertility may become especially intense when women undergo assisted reproductive treatments such as in vitro fertilization (IVF). IVF is a physically and emotionally demanding process

involving medical examinations, hormonal stimulation, oocyte retrieval, fertilization procedures, embryo transfer, and a period of uncertainty before the treatment outcome is known. These procedures may be accompanied by financial concerns, disruption of daily routines, physical discomfort, concerns about treatment success, and repeated fluctuations between hope and fear. Women may enter treatment with considerable emotional vulnerability even before the IVF procedure begins. Research on emotional risk factors prior to IVF has shown that infertile couples can demonstrate important psychological difficulties before treatment, underscoring the need to consider emotional functioning as an integral component of reproductive care (Kargar et al., 2024). Concerns regarding infertility treatment itself, including perceived risks, burden, efficacy, and possible adverse outcomes, may further contribute to emotional strain and treatment-related apprehension (Greil et al., 2020).

The treatment trajectory can also produce changing patterns of psychological distress. Rather than remaining constant, depression and anxiety may fluctuate across different stages of an IVF or intracytoplasmic sperm injection treatment cycle, suggesting that reproductive treatment involves a dynamic emotional process (Li et al., 2021). This process becomes particularly critical when treatment is unsuccessful. An unsuccessful IVF attempt may constitute a psychologically significant loss because it represents the failure of an intervention into which considerable physical, financial, relational, and emotional resources have been invested. Women may experience sadness, anxiety, frustration, helplessness, grief, reduced perceived control, and uncertainty regarding whether treatment should be repeated. Qualitative evidence has shown that psychological distress during assisted reproductive treatment develops through complex interactions among infertility experiences, treatment demands, changes in self-perception, uncertainty, and social relationships (Jiang et al., 2024). Consequently, unsuccessful IVF should be understood not merely as an unsuccessful medical procedure but as a potentially destabilizing psychological event.

Psychological distress in this context can encompass symptoms of depression, anxiety, and stress that interfere with emotional well-being and daily functioning. The experience of unsuccessful treatment may intensify negative thoughts regarding future fertility, personal inadequacy, marital expectations, financial investment, and the possibility of remaining childless. However, women exposed to similar reproductive difficulties do not

necessarily develop equivalent levels of distress. Some women may gradually adapt, reconsider available options, maintain engagement with valued life activities, and tolerate uncertainty, whereas others may experience persistent negative affect, rigid thinking, difficulty expressing emotions, or increasing dependence on reassurance. Such individual differences suggest that the psychological consequences of unsuccessful IVF cannot be fully explained by medical factors alone. Psychological characteristics that influence how women interpret, regulate, communicate, and adapt to stressful experiences may be central to understanding why distress becomes more severe in some individuals than in others.

One potentially important factor is psychological flexibility. Psychological flexibility generally refers to an individual's capacity to adapt cognitive and behavioral responses to changing environmental and psychological demands rather than remaining dominated by rigid thought patterns, avoidance, or ineffective coping strategies. It involves the ability to consider alternative interpretations, modify responses when circumstances change, tolerate uncertainty, and continue functioning in the presence of difficult internal experiences. Psychological flexibility is particularly relevant in situations characterized by low controllability, prolonged ambiguity, and emotional pressure. Research has demonstrated an inverse relationship between psychological flexibility and perceived stress, suggesting that individuals who respond more flexibly to challenging circumstances may experience lower psychological burden (Cyniak-Cieciura, 2021). Prospective evidence has similarly identified psychological inflexibility as an important process associated with the persistence of stress-related symptoms, emphasizing that rigid responses to internal and external experiences may contribute to emotional difficulties over time (Gorday et al., 2023).

Cognitive flexibility, as a closely related component of flexible psychological functioning, may also contribute to adaptive decision-making under uncertain conditions. The capacity to consider alternative possibilities and modify interpretations appears to be meaningfully associated with intolerance of uncertainty, decision-making, and subjective well-being (Yildiz & Eldeleklioglu, 2021). These capacities may be particularly important following an unsuccessful IVF cycle because women are often required to make difficult decisions about whether to repeat treatment, change treatment strategies, consider alternative reproductive options, or temporarily discontinue medical intervention. Greater flexibility may allow women to evaluate the

unsuccessful attempt without interpreting it as definitive evidence of hopelessness or personal failure. In contrast, rigid interpretations may strengthen catastrophic expectations, repetitive negative thinking, perceived helplessness, and emotional distress.

The potential clinical importance of psychological flexibility in infertility is supported by emerging intervention research. Acceptance and Commitment Therapy approaches emphasize willingness to experience difficult thoughts and emotions while maintaining engagement with personally meaningful actions. A pilot investigation of an infertility-adapted Acceptance and Commitment Therapy program demonstrated the feasibility and potential psychological value of targeting acceptance and flexibility among women experiencing infertility (Balsom et al., 2024). More broadly, systematic reviews of mental health interventions for infertile women indicate that psychological interventions can improve important dimensions of emotional functioning and suggest that modifiable psychological processes should receive greater attention within infertility care (Koochaksaraei et al., 2023). A more recent systematic review and meta-analysis has likewise demonstrated the efficacy of psychological interventions for infertile women, reinforcing the clinical importance of identifying specific psychological mechanisms that can become targets for prevention and treatment (Jackson et al., 2025). Psychological flexibility may therefore represent an important protective resource following unsuccessful IVF.

Alongside individual cognitive and regulatory capacities, relational processes are also likely to influence psychological responses to infertility. Attachment theory provides an important framework for understanding how individuals seek emotional security and support under conditions of threat. Foundational attachment research proposed that the availability and responsiveness of significant others contribute to feelings of security and influence responses to stressful or uncertain situations (Ainsworth et al., 2015). In adulthood, attachment relationships continue to organize expectations concerning closeness, support, trust, emotional accessibility, and responses to interpersonal threat. Adult attachment research further emphasizes that individual differences in attachment-related anxiety, avoidance, and security are closely related to emotion regulation, interpersonal functioning, and psychological adjustment (Gillath et al., 2016).

Within marriage, attachment needs can include the need to feel emotionally secure, loved, valued, important,

supported, and confident that one's partner will remain available and responsive during stressful circumstances. The development of a marital attachment-needs measure has highlighted the relevance of these experiences as distinct but interconnected components of intimate relational functioning (Samani et al., 2023). Such needs may become particularly salient during infertility treatment because both partners encounter uncertainty, repeated medical procedures, financial pressure, disrupted expectations, and disappointment. Following unsuccessful IVF, women may have heightened needs for reassurance, empathy, availability, emotional validation, and shared coping. If these needs are adequately met, the intimate relationship may function as an important source of psychological security. Conversely, perceived emotional unavailability or inadequate responsiveness from the partner may intensify isolation, insecurity, disappointment, and distress.

Empirical research supports the importance of attachment in infertility. Romantic attachment characteristics have been associated with infertility-related stress among women, indicating that attachment anxiety and avoidance may shape emotional adjustment to fertility difficulties (Calvo et al., 2023). Research among infertile couples has also demonstrated relationships between attachment styles and positive emotional experiences, with emotional information processing representing an important mechanism through which attachment characteristics may influence psychological functioning (Kafiabadi et al., 2024). At a broader level, systematic review and meta-analytic evidence indicates that attachment dimensions are meaningfully associated with psychological outcomes among individuals experiencing infertility (Tacchino et al., 2025). These findings support the assumption that infertility-related distress occurs within a relational context and that satisfaction of attachment needs may provide a protective interpersonal resource following unsuccessful treatment.

Attachment processes may be especially important because close relationships contribute substantially to emotion regulation. A secure and responsive partner can facilitate the recognition, expression, and regulation of distress by providing a context in which difficult emotions are acknowledged rather than avoided. In contrast, unmet attachment needs may limit supportive emotional communication and increase the tendency to suppress or poorly process negative affect. Infertile women may need to communicate complex emotional experiences involving grief, fear, anger, shame, disappointment, envy, uncertainty, and concerns about the future of the family. If the marital

relationship does not provide sufficient emotional security, these experiences may become increasingly difficult to regulate and may contribute to greater psychological distress.

Another psychological characteristic that may be particularly relevant in this process is alexithymia. Alexithymia refers to difficulties in identifying and describing emotional states and a tendency toward externally oriented thinking. Individuals with greater alexithymic characteristics may experience emotional activation without being able to clearly differentiate, label, or communicate what they are feeling. In stressful circumstances, this difficulty may interfere with adaptive emotion regulation because successful regulation generally requires at least some capacity to identify the nature and source of emotional experience. When emotions remain poorly differentiated, individuals may instead experience diffuse psychological tension, physiological discomfort, interpersonal misunderstanding, or ineffective coping.

The association between alexithymia and infertility-related psychological difficulties has received direct empirical support. Women undergoing assisted reproductive treatment who demonstrate higher alexithymia have been found to report greater infertility-related stress and poorer quality of life, indicating that difficulties in emotional awareness may meaningfully influence adaptation to reproductive treatment (Renzi et al., 2020). A case-control investigation also demonstrated significant relationships among alexithymia, stress, and depression in infertile women, further supporting alexithymia as an emotional vulnerability factor in this population (Gourounti & Giannikaki, 2021). Similarly, research specifically examining female infertility, alexithymia, and stress has reinforced the relevance of impaired emotional identification and processing in the psychological experience of infertility (Campos et al., 2023).

Alexithymia may become particularly problematic following unsuccessful IVF because treatment failure can generate multiple simultaneous and potentially conflicting emotions. A woman may experience grief over the unsuccessful cycle, fear regarding future reproductive possibilities, anger toward herself or others, shame associated with infertility, anxiety about repeated treatment, and disappointment regarding unmet expectations. When these emotions cannot be identified and verbalized clearly, they may be more difficult to regulate and communicate to partners or healthcare providers. This may reduce opportunities for emotional support and increase subjective

distress. Furthermore, because infertility treatment often places considerable emphasis on biological indicators, laboratory procedures, and medical decisions, an externally oriented cognitive style may further discourage attention to internal emotional experience, potentially allowing distress to accumulate.

Psychological flexibility, attachment needs, and alexithymia may therefore represent complementary dimensions of adaptation following unsuccessful IVF. Psychological flexibility concerns the capacity to adapt to changing circumstances and respond to difficult internal experiences without becoming dominated by rigid patterns. Attachment needs concern the relational security and responsiveness available when women are coping with threat, loss, and uncertainty. Alexithymia concerns the capacity to identify, differentiate, and communicate emotional experiences. Together, these variables represent cognitive-regulatory, interpersonal, and emotional-processing pathways through which women may differ in their vulnerability to psychological distress.

The importance of integrating these factors is reinforced by the broader infertility literature. Existing studies have established the substantial prevalence of psychological difficulties among infertile women and the dynamic nature of emotional distress throughout infertility treatment. They have also separately demonstrated the relevance of attachment, emotional processing, psychological flexibility, and alexithymia. However, much of the literature has investigated these factors independently rather than examining their simultaneous contribution to psychological distress following a specifically unsuccessful IVF experience. This distinction is important because treatment failure may activate several psychological systems at once: women must cognitively adapt to an unwanted outcome, regulate intense emotions, tolerate uncertainty, seek interpersonal security, communicate distress, and make decisions about subsequent treatment.

An integrated predictive examination may therefore provide a more comprehensive understanding of psychological vulnerability following unsuccessful IVF. Such an approach is also clinically relevant because psychological flexibility, relational needs, and emotional-awareness difficulties are potentially assessable and modifiable factors. Identifying women who demonstrate low flexibility, inadequately fulfilled attachment needs, or pronounced alexithymic characteristics may help fertility professionals recognize those at increased risk of depression, anxiety, and stress. Psychological screening may therefore

complement medical treatment and enable more individualized supportive care, particularly after unsuccessful cycles when emotional vulnerability may be heightened. The accumulating evidence concerning psychological interventions in infertility also suggests that addressing these processes may have practical value in developing more targeted interventions rather than relying exclusively on general supportive counseling.

Accordingly, the present study aimed to predict psychological distress based on psychological flexibility, attachment needs, and alexithymia among infertile women who had experienced unsuccessful IVF.

2. Methods and Materials

2.1. Study design and Participant

This study employed a quantitative, cross-sectional, descriptive-correlational design. Structural equation modeling (SEM) was used to examine the predictive relationships among psychological distress, psychological flexibility, attachment needs, and alexithymia in infertile women who had experienced unsuccessful in vitro fertilization (IVF). The study population consisted of infertile women receiving treatment at infertility centers in Shiraz, Iran, during 2025–2026 who had experienced at least one unsuccessful IVF cycle. A total of 280 eligible women were recruited using purposive non-probability sampling.

Eligible participants were women whose infertility and unsuccessful IVF treatment had been confirmed by a specialist, who were willing to participate, had sufficient proficiency in Persian to understand and complete the study measures, and were not simultaneously receiving another structured psychological intervention. Participants were excluded if they returned substantially incomplete questionnaires, withdrew from participation, became pregnant during the data-collection period, were receiving medications considered likely to substantially interfere with psychological assessment, or had an acute medical or major psychiatric condition, including psychotic-spectrum or bipolar disorders, that could compromise participation or questionnaire completion.

Following receipt of the necessary institutional and clinical permissions, eligible women attending infertility treatment centers were approached and informed about the purpose and procedures of the study. Participation was voluntary, and informed consent was obtained before data collection. Questionnaires were administered either in paper form or through an electronic survey link, depending on

participants' accessibility and preferences. Completed questionnaires were reviewed for completeness and data quality before statistical analysis.

Participants were informed that their information would remain confidential, that data would be used solely for research purposes, and that they could withdraw at any time without adverse consequences. Personally identifying information was not included in the analytical dataset. Ethical and cultural considerations were observed throughout data collection, and participants who wished to receive information about the overall results were provided with an understandable summary after completion of the study. The study received ethical approval from the Research Ethics Committee of Islamic Azad University, Marvdasht Branch, with the ethics code IR.IAU.M.REC.1404.362.

2.2. Measures

Depression Anxiety Stress Scales–21 (DASS-21). Psychological distress was assessed using the 21-item Depression Anxiety Stress Scales developed by Lovibond and Lovibond (1995). The DASS-21 is a self-report measure designed to assess three related dimensions of negative emotional states over the preceding week: depression, anxiety, and stress. Each dimension consists of seven items. The Depression subscale comprises items 3, 5, 10, 13, 16, 17, and 21; the Anxiety subscale includes items 2, 4, 7, 9, 15, 19, and 20; and the Stress subscale consists of items 1, 6, 8, 11, 12, 14, and 18. Items are rated on the standard four-point response scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). Thus, each subscale has a raw score ranging from 0 to 21, while the summed 21-item raw score ranges from 0 to 63, with higher scores indicating greater negative emotional symptomatology and psychological distress. When the conventional DASS severity classifications are required, each DASS-21 subscale score may be multiplied by two to make it comparable with the original 42-item DASS norms (Lovibond & Lovibond, 1995). The standard 0–3 response format is confirmed in the original DASS framework. The DASS has demonstrated satisfactory construct validity and reliability across clinical and nonclinical populations (Lovibond & Lovibond, 1995). In the present sample, Cronbach's alpha for the DASS-21 was .802, indicating satisfactory internal consistency.

Cognitive Flexibility Inventory (CFI). The construct referred to in the present study as psychological flexibility

was operationalized using the Cognitive Flexibility Inventory developed by Dennis and Vander Wal (2010). The CFI is a 20-item self-report questionnaire designed to assess an individual's perceived ability to respond flexibly to difficult situations, perceive alternative explanations and solutions, and view challenging situations as controllable. The original instrument was developed particularly to assess aspects of cognitive flexibility relevant to identifying and replacing maladaptive thoughts with more adaptive alternatives (Dennis & Vander Wal, 2010). The bibliographic record in the source document identifies the original measure as Dennis and Vander Wal's Cognitive Flexibility Inventory: Instrument Development and Estimates of Reliability and Validity (2010). Items are scored on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items 2, 4, 7, 9, 11, and 17 are reverse-scored. Total scores can range from 20 to 140, with higher scores reflecting greater cognitive flexibility. In the Iranian adaptation used in the present study, the instrument is represented by three components: Alternatives, Control, and Alternatives for Human Behaviors. The Alternatives component contains 10 items, the Control component contains eight items, and Alternatives for Human Behaviors contains two items. This three-factor structure has specifically been reported for the Iranian adaptation, whereas the original English CFI was initially conceptualized as a two-factor instrument (Shareh et al., 2014). Dennis and Vander Wal (2010) reported evidence of convergent and concurrent validity, including a correlation of approximately .75 with another measure of cognitive flexibility and a negative association with depressive symptoms. For the Iranian version, Shareh et al. (2014) reported a Cronbach's alpha of .90 and a test–retest coefficient of .71 for the total scale, supporting its use in Iranian populations. In the present sample, Cronbach's alpha for the total CFI was .902.

Marital Attachment Needs Scale (MANS). Attachment needs were assessed using the 12-item Marital Attachment Needs Scale developed by Samani, Sohrabi, Moslehi, and Vesal Shirazi (2023). The instrument was developed through a mixed-method procedure based initially on attachment-focused interviews with married individuals. Its items represent core attachment-related experiences within an intimate relationship, including perceived security, being loved, being valued and important, receiving care and support, and experiencing the partner as emotionally available. The original scale-development study confirms that the final MANS contains 12 items rated on a five-point

scale from strongly disagree to strongly agree. Following reverse scoring of negatively phrased items, responses are summed to obtain a total score ranging from 12 to 60, with higher scores representing a greater degree of fulfillment or availability of marital attachment needs. Factor analysis conducted during scale development supported a single general factor of marital attachment needs, with an eigenvalue of 6.26 accounting for 52.19% of the variance. The original study also demonstrated convergent and divergent validity and reported Cronbach's alpha of .90 and two-week test-retest reliability of .92 (Samani et al., 2023). These psychometric findings are also reported in the study documentation. Cronbach's alpha for the MANS in the present sample was .708.

Toronto Alexithymia Scale-20 (TAS-20). Alexithymia was assessed using the 20-item Toronto Alexithymia Scale (TAS-20), developed and psychometrically established by Bagby, Parker, and Taylor (1994). The scale assesses three central components of alexithymia: Difficulty Identifying Feelings (DIF; seven items: 1, 3, 6, 7, 9, 13, and 14), Difficulty Describing Feelings (DDF; five items: 2, 4, 11, 12, and 17), and Externally Oriented Thinking (EOT; eight items: 5, 8, 10, 15, 16, 18, 19, and 20). The original validation studies supported the reliability and three-factor structure of the TAS-20 (Bagby et al., 1994). Responses are provided on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Items 4, 5, 10, 18, and 19 are reverse-scored. The total score ranges from 20 to 100, with higher values reflecting greater alexithymic characteristics. Conventional interpretive criteria classify scores of 51 or lower as non-alexithymic, scores of 52–60 as possible or borderline alexithymia, and scores of 61 or higher as indicative of alexithymia; however, in the present predictive analyses, the TAS-20 was treated as a continuous measure rather than categorizing participants. The Persian version of the TAS-20 has demonstrated satisfactory internal consistency, test-retest reliability, concurrent validity, and replication of the original three-factor structure in Iranian samples (Besharat, 2007). The study documentation additionally reports test-retest reliability of .79 for the total scale and coefficients ranging from .62 to .69 across the three

subscales in the Persian validation work. In the present sample, Cronbach's alpha for the total TAS-20 was .851.

2.3. Data Analysis

Data were analyzed using IBM SPSS Statistics version 26 and AMOS version 24. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were calculated to characterize the participants and study variables. Internal consistency of the measures was evaluated using Cronbach's alpha. Before inferential analysis, the data were examined with respect to relevant statistical assumptions, including distributional normality, linearity, and multicollinearity. Pearson correlation coefficients were used to examine bivariate relationships among psychological distress, psychological flexibility, attachment needs, and alexithymia. Structural equation modeling was used to evaluate the predictive relationships among the variables, with psychological distress specified as the principal outcome. Statistical significance was evaluated at $p < .05$.

3. Findings and Results

A total of 280 infertile women who had experienced at least one unsuccessful IVF cycle were included in the analyses. With regard to age, the largest proportion of participants were 35–39 years old (32.14%), followed by those aged 31–34 years (28.92%), younger than 30 years (23.57%), and older than 40 years (15.36%). Regarding duration of marriage, 39.64% had been married for 6–15 years, 31.42% for 1–5 years, 17.51% for 16 years or longer, and 11.42% for less than one year. Most participants held a bachelor's degree (60.35%). In terms of employment, 42.50% were homemakers, 29.28% were employed in governmental or private organizations, and 28.21% were self-employed or business owners. The reported infertility factor was male in 47.50% of cases, female in 38.57%, and combined in 13.92%. In addition, 56.78% reported a history of previous infertility treatments, and 63.57% reported a history of psychological problems.

Table 1

Demographic and Clinical Characteristics of the Participants (N = 280)

Variable	Category	n	%
Age (years)	<30	66	23.57
	31–34	81	28.92
	35–39	90	32.14
	>40	43	15.36
Duration of marriage	<1 year	32	11.42
	1–5 years	88	31.42
	6–15 years	111	39.64
	≥16 years	49	17.51
Education	High school diploma or lower	58	20.71
	Associate degree	44	15.71
	Bachelor's degree	169	60.35
	Master's degree or higher	9	3.22
Employment status	Homemaker	119	42.50
	Government/private-sector employee	82	29.28
	Self-employed/business owner	79	28.21
Infertility factor	Male factor	133	47.50
	Female factor	108	38.57
	Combined factor	39	13.92
Previous infertility treatment	Yes	159	56.78
	No	121	43.21
History of psychological problems	Yes	178	63.57
	No	102	36.42

Descriptive statistics for the variables retained in the present study are presented in Table 2. Among the dimensions of psychological distress, anxiety showed the highest mean ($M = 17.95$, $SD = 4.19$), followed by stress ($M = 16.64$, $SD = 4.09$) and depression ($M = 15.98$, $SD = 4.03$). For psychological flexibility, the mean scores were 48.28 ($SD = 8.03$) for Alternatives, 32.95 ($SD = 7.19$) for Control,

and 8.94 ($SD = 2.09$) for Alternatives for Human Behaviors. The mean attachment-needs score was 34.78 ($SD = 7.39$). Regarding alexithymia, the mean scores were 18.93 ($SD = 4.89$) for Difficulty Identifying Feelings, 13.70 ($SD = 4.09$) for Difficulty Describing Feelings, and 19.42 ($SD = 5.03$) for Externally Oriented Thinking.

Table 2

Descriptive Statistics for the Study Variables and Their Dimensions

Construct	Dimension	M	SD	Skewness	Kurtosis
Psychological distress	Depression	15.98	4.03	0.721	0.679
	Anxiety	17.95	4.19	−0.317	−0.194
	Stress	16.64	4.09	0.658	0.728
Psychological flexibility	Alternatives	48.28	8.03	0.720	0.732
	Control	32.95	7.19	0.329	0.935
	Alternatives for Human Behaviors	8.94	2.09	0.458	0.931
Attachment needs	Total score	34.78	7.39	0.677	0.179
Alexithymia	Difficulty Identifying Feelings	18.93	4.89	0.721	0.629
	Difficulty Describing Feelings	13.70	4.09	−0.339	−0.174
	Externally Oriented Thinking	19.42	5.03	−0.558	0.738

The skewness and kurtosis coefficients were within acceptable ranges and did not indicate severe departures from univariate normality. In addition, the Kolmogorov–Smirnov test was nonsignificant for psychological distress ($p = .089$), psychological flexibility ($p = .059$), attachment needs ($p = .078$), and alexithymia ($p = .086$). The

examination of scatterplots also indicated no substantial deviation from linearity. Thus, the principal distributional assumptions required for the subsequent analyses were considered adequately satisfied. Confirmatory factor analysis indicated satisfactory measurement-model fit for each of the four constructs included in the article. Relative

chi-square values ranged from 1.138 to 1.466, and RMSEA values ranged from .022 to .057. The GFI, NFI, RFI, IFI, and CFI indices were also within the acceptable range for all four

measurement models. These findings supported the adequacy of the measurement models prior to examination of the predictive relationships.

Table 3

Fit Indices for the Confirmatory Measurement Models

Construct	χ^2/df	RMSEA	RMR	GFI	NFI	RFI	IFI	CFI
Psychological distress	1.365	.035	.028	.941	.926	.922	.979	.979
Psychological flexibility	1.138	.022	.044	.978	.946	.942	.993	.993
Attachment needs	1.466	.039	.064	.962	.987	.982	.996	.996
Alexithymia	1.458	.057	.097	.912	.954	.921	.957	.973

The factor loadings reported for the indicators of psychological distress, psychological flexibility, attachment needs, and alexithymia were above the minimum criterion of .40 and were statistically significant. The measurement analyses therefore supported adequate convergent measurement properties of the retained constructs.

Pearson correlation analysis showed significant associations among the variables. Psychological flexibility was negatively correlated with psychological distress ($r = -.17, p < .01$), indicating that greater flexibility was

associated with lower psychological distress. Attachment needs were also negatively related to psychological distress ($r = -.47, p < .05$). In contrast, alexithymia showed a strong positive correlation with psychological distress ($r = .65, p < .01$). Alexithymia was negatively associated with both psychological flexibility ($r = -.78, p < .01$) and attachment needs ($r = -.57, p < .01$). Psychological flexibility and attachment needs were negatively correlated ($r = -.13, p < .05$).

Table 4

Correlations Among Psychological Distress, Psychological Flexibility, Attachment Needs, and Alexithymia

Variable	1	2	3	4
1. Psychological distress	1			
2. Psychological flexibility	-.17**	1		
3. Attachment needs	-.47*	-.13*	1	
4. Alexithymia	.65**	-.78**	-.57**	1

The main analysis examined whether psychological flexibility, attachment needs, and alexithymia significantly predicted psychological distress among women who had experienced unsuccessful IVF. The path analyses demonstrated that all three predictors had statistically significant direct relationships with psychological distress. Psychological flexibility had a significant inverse effect on psychological distress. The reported path coefficient indicated that greater psychological flexibility was associated with lower psychological distress ($\beta = -.58, p < .001$). Thus, women with a greater capacity to respond flexibly to difficult psychological and situational demands tended to report lower levels of depression, anxiety, and stress following unsuccessful IVF. This finding supported the hypothesized predictive role of psychological flexibility.

Attachment needs also significantly predicted psychological distress ($\beta = -.48, p < .001$). Higher levels of attachment-related security, emotional support, availability, and responsiveness were associated with lower psychological distress. Accordingly, participants whose attachment needs were more adequately fulfilled tended to report fewer symptoms of distress in the context of unsuccessful IVF. In contrast, alexithymia had a significant positive effect on psychological distress ($\beta = .43, p < .001$). Higher difficulty identifying and describing emotions and greater externally oriented thinking were associated with greater psychological distress. Thus, women with higher alexithymia were more likely to report elevated depression, anxiety, and stress following unsuccessful IVF.

Table 5

Direct Effects of Psychological Flexibility, Attachment Needs, and Alexithymia on Psychological Distress

Predictor	Outcome	β	p	Direction	Result
Psychological flexibility	Psychological distress	-.58	<.001	Negative	Significant
Attachment needs	Psychological distress	-.48	<.001	Negative	Significant
Alexithymia	Psychological distress	.43	<.001	Positive	Significant

Collectively, the findings showed that psychological distress among women following unsuccessful IVF was significantly associated with all three psychological factors examined in the study. Psychological flexibility and fulfillment of attachment needs functioned in a protective direction, whereas alexithymia represented a psychological vulnerability factor. Among the bivariate associations, alexithymia demonstrated the strongest relationship with psychological distress ($r = .65$), while all three direct predictive paths were statistically significant. These findings support the predictive framework in which lower psychological flexibility, less adequately fulfilled attachment needs, and greater alexithymia are associated with higher psychological distress among infertile women following unsuccessful IVF.

4. Discussion

The present study investigated the predictive roles of psychological flexibility, attachment needs, and alexithymia in psychological distress among infertile women who had experienced unsuccessful in vitro fertilization (IVF). The findings showed that all three psychological variables significantly predicted psychological distress. Specifically, greater psychological flexibility was associated with lower psychological distress ($\beta = -.58$, $p < .001$), greater fulfillment of attachment needs was associated with lower psychological distress ($\beta = -.48$, $p < .001$), and higher alexithymia was associated with greater psychological distress ($\beta = .43$, $p < .001$). The correlational findings were consistent with these structural relationships: psychological flexibility was negatively associated with psychological distress ($r = -.17$, $p < .01$), attachment needs were negatively associated with psychological distress ($r = -.47$, $p < .05$), and alexithymia showed a strong positive association with psychological distress ($r = .65$, $p < .01$). Taken together, these findings indicate that psychological distress following unsuccessful IVF is not solely a consequence of the reproductive outcome itself but is also related to women's capacity to adapt flexibly to stressful circumstances,

experience emotional security within intimate relationships, and identify and express difficult emotional states.

The finding that greater psychological flexibility predicted lower psychological distress is consistent with previous evidence emphasizing the adaptive role of flexibility under stressful and uncertain conditions. Psychological flexibility enables individuals to alter ineffective cognitive and behavioral responses, generate alternative interpretations of difficult circumstances, and respond to negative internal experiences without becoming excessively dominated by them. Cyniak-Cieciura demonstrated that psychological flexibility is meaningfully related to perceived stress, suggesting that greater flexibility may reduce the subjective burden associated with demanding life experiences (Cyniak-Cieciura, 2021). Similarly, prospective evidence has shown that psychological inflexibility contributes to the persistence and reciprocal intensification of stress-related symptoms over time (Gorday et al., 2023). These findings are compatible with the present results because unsuccessful IVF represents an emotionally demanding event characterized by uncertainty, reduced perceived control, and potentially repeated exposure to disappointment.

One explanation for the negative relationship between psychological flexibility and psychological distress may be found in the way women interpret and respond to treatment failure. An unsuccessful IVF cycle can threaten strongly held expectations concerning motherhood, future family life, bodily competence, and reproductive control. Women with lower psychological flexibility may become more cognitively attached to catastrophic interpretations, such as perceiving treatment failure as evidence that future attempts will inevitably fail or that parenthood is unattainable. Such interpretations may intensify hopelessness, anxiety, and stress. By contrast, women with greater flexibility may be more able to acknowledge the emotional significance of the unsuccessful treatment while simultaneously reconsidering available options, reorganizing expectations, and maintaining engagement with other meaningful areas of life. Research examining the relationship between cognitive

flexibility, intolerance of uncertainty, decision-making, and happiness similarly suggests that flexible cognition facilitates adaptation when individuals must make decisions under ambiguous conditions (Yildiz & Eldeleklioglu, 2021). This capacity may be especially important for women deciding whether to continue treatment, alter medical strategies, or reconsider future reproductive plans.

The present finding is also supported by intervention research among women experiencing infertility. Balsom et al. examined an Acceptance and Commitment Therapy intervention specifically adapted for women with infertility and demonstrated the potential usefulness of targeting acceptance and flexible psychological responding in this population (Balsom et al., 2024). Acceptance-based approaches may be particularly relevant after unsuccessful IVF because women cannot immediately change the failed reproductive outcome, but they may be able to modify how they respond to painful thoughts, emotions, and uncertainty. The current findings are also compatible with systematic evidence showing that psychological interventions can improve mental health outcomes among infertile women (Koochaksaraei et al., 2023). More recent meta-analytic evidence has further demonstrated the efficacy of psychological interventions in reducing psychological difficulties among women experiencing infertility (Jackson et al., 2025). These findings collectively support the interpretation that psychological flexibility is not only associated with distress but may also represent a clinically modifiable factor that can be strengthened within infertility-related psychological care.

The second major finding indicated that greater fulfillment of attachment needs significantly predicted lower psychological distress. This finding is consistent with attachment theory, according to which emotionally secure relationships provide a regulatory context during periods of threat, uncertainty, and loss. Attachment processes originally described within early caregiver relationships continue to shape expectations regarding emotional accessibility, responsiveness, safety, and support in later interpersonal relationships (Ainsworth et al., 2015). Adult attachment research similarly emphasizes that attachment systems remain relevant throughout adulthood and influence how individuals seek support, regulate emotions, respond to interpersonal threats, and maintain closeness with significant others (Gillath et al., 2016). Within the context of infertility, these processes may become particularly salient because reproductive treatment is usually experienced within a marital or intimate relational context.

The findings are also consistent with research specifically examining attachment among infertile women and couples. Calvo et al. reported meaningful associations between romantic attachment characteristics and infertility-related stress, indicating that attachment anxiety and avoidance may contribute to emotional vulnerability during infertility (Calvo et al., 2023). Similarly, Tacchino et al., in a systematic review and meta-analysis, demonstrated that attachment dimensions are significantly related to psychological outcomes associated with infertility (Tacchino et al., 2025). Kafiabadi et al. further found that attachment styles were associated with positive feelings among infertile couples and highlighted the mediating role of emotional information processing (Kafiabadi et al., 2024). These studies support the present finding that attachment-related experiences may influence the degree of distress experienced following unsuccessful reproductive treatment.

The role of attachment needs may be especially important after failed IVF because this experience can activate needs for reassurance, closeness, emotional availability, validation, and support. The Marital Attachment Needs framework emphasizes experiences such as feeling secure, loved, valued, important, cared for, and emotionally supported within the marital relationship (Samani et al., 2023). When these needs are adequately met, the partner may function as an emotional resource who facilitates coping with disappointment and uncertainty. A woman who perceives her partner as available and responsive may feel better able to communicate grief, fear, anger, or uncertainty and may be less likely to experience reproductive failure in isolation. In contrast, when attachment needs remain unmet, unsuccessful IVF may be accompanied by additional feelings of emotional abandonment, relational insecurity, misunderstanding, or loneliness. These additional relational stressors may intensify depressive, anxious, and stress-related symptoms.

Another possible explanation is that secure attachment-related experiences may facilitate interpersonal emotion regulation. Women experiencing unsuccessful IVF may confront complex and fluctuating emotions that are difficult to manage individually. A responsive partner can provide reassurance, help organize emotional experiences, normalize reactions, and create an environment in which distress can be expressed without fear of rejection. Conversely, women who perceive low emotional availability may suppress distress or attempt to cope independently, potentially increasing emotional burden. The association identified by Kafiabadi et al. between attachment and emotional

information processing among infertile couples supports this interpretation (Kafiabadi et al., 2024). The current results therefore reinforce the importance of conceptualizing infertility-related psychological distress not exclusively as an individual phenomenon but also as an experience embedded within intimate relational processes.

The third major finding showed that alexithymia significantly and positively predicted psychological distress. In addition, alexithymia demonstrated the strongest bivariate association with psychological distress among the variables examined. This finding is consistent with previous research showing that difficulties in identifying and describing emotions are associated with poorer psychological adjustment among infertile women. Renzi et al. found that alexithymia was significantly associated with greater infertility-related stress and reduced quality of life among women undergoing assisted reproductive treatment (Renzi et al., 2020). Gourounti and Giannikaki similarly reported meaningful relationships among alexithymia, stress, and depression in infertile women (Gourounti & Giannikaki, 2021). Furthermore, Campos et al. demonstrated an association between female infertility, alexithymia, and stress, reinforcing the relevance of emotional-awareness difficulties to psychological functioning in this population (Campos et al., 2023).

The positive association between alexithymia and psychological distress may be explained by impaired emotional identification and regulation. After unsuccessful IVF, women may experience grief, disappointment, anxiety, anger, shame, fear of repeated failure, uncertainty about future parenthood, and concerns about financial or relational consequences. Adaptive emotional processing requires individuals to differentiate these experiences, understand their sources, and communicate them effectively. Women with greater alexithymia may instead experience emotional arousal as vague psychological discomfort or bodily tension without being able to accurately label or interpret what they are feeling. This reduced emotional clarity may interfere with effective coping and increase susceptibility to depression, anxiety, and stress. The strong correlation between alexithymia and psychological distress in the present study is therefore consistent with the proposition that difficulty understanding internal emotional states can amplify the burden of infertility-related stress.

Difficulty describing emotions may also reduce access to interpersonal support. Women who cannot clearly communicate their emotional states may find it more difficult to convey needs to their spouse, family members, or

healthcare professionals. As a result, potentially supportive individuals may underestimate the intensity or nature of the woman's distress. This problem may be particularly important following unsuccessful IVF, when women may require reassurance, emotional validation, and opportunities to process disappointment. The relationship between alexithymia and poorer quality of life reported by Renzi et al. supports the possibility that emotional-processing difficulties affect not only symptoms of distress but also broader psychosocial functioning during infertility treatment (Renzi et al., 2020).

The present findings should also be interpreted against the broader psychological burden documented among women undergoing infertility treatment. Systematic review and meta-analytic evidence indicates that infertility is associated with substantial psychological consequences and elevated risks of anxiety, depression, and impaired well-being among women (Nik Hazlina et al., 2022). Studies conducted in clinical infertility populations have similarly demonstrated significant rates of common mental disorders and psychological symptoms (Kamboj et al., 2023). Dadhwal et al. further reported significant depression, anxiety, quality-of-life difficulties, and coping problems among infertile women (Dadhwal et al., 2022). These findings provide a broader context for the elevated psychological distress observed in women following unsuccessful IVF.

Treatment-related characteristics may further contribute to this vulnerability. Women beginning IVF may already present with clinically relevant emotional risk factors before the treatment process starts (Kargar et al., 2024). Anxiety and depressive symptoms may also change dynamically during IVF and intracytoplasmic sperm injection treatment cycles rather than remaining stable (Li et al., 2021). Similarly, Wang et al. demonstrated significant rates and predictors of anxiety and depression among women undergoing infertility treatment (Wang et al., 2023). Concerns regarding treatment procedures, consequences, and effectiveness may add further psychological pressure (Greil et al., 2020). Thus, women who experience unsuccessful IVF may encounter the cumulative effects of pre-existing infertility-related distress, treatment-specific burden, and disappointment following treatment failure.

Qualitative research further demonstrates that infertility-related psychological distress is multidimensional. Jiang et al. showed that distress among women receiving assisted reproductive treatment emerges through complex interactions involving treatment experiences, identity-

related concerns, uncertainty, psychological reactions, and social circumstances (Jiang et al., 2024). The present findings extend this perspective by identifying three psychological characteristics that may help explain individual differences in the intensity of such distress. Psychological flexibility may influence how women cognitively adapt to an uncontrollable outcome, attachment needs may determine the degree of relational security available during the crisis, and alexithymia may influence the ability to recognize, communicate, and regulate emotional experiences.

Taken together, the results support a multidimensional model of psychological adjustment following unsuccessful IVF. Lower psychological flexibility may increase cognitive rigidity and difficulties adapting to uncertainty; unmet attachment needs may reduce perceived interpersonal security and emotional support; and greater alexithymia may interfere with the recognition and communication of distressing emotions. These processes may operate simultaneously rather than independently. For example, a woman who experiences treatment failure may have difficulty considering alternative interpretations, may feel emotionally unsupported by her partner, and may simultaneously struggle to identify or verbalize her emotional state. Such a combination could substantially intensify psychological distress. In contrast, psychological flexibility, relational security, and effective emotional awareness may collectively provide protective resources that facilitate adaptation after treatment failure. The findings therefore support the value of integrating cognitive, relational, and emotional-processing variables when attempting to understand psychological distress among infertile women.

Several limitations should be considered when interpreting the findings. First, the cross-sectional and correlational design prevents causal conclusions regarding the direction of relationships among psychological flexibility, attachment needs, alexithymia, and psychological distress. Second, participants were recruited through purposive non-probability sampling from infertility treatment centers in Shiraz, which may limit the generalizability of the findings to women from other geographical, cultural, socioeconomic, or healthcare contexts. Third, all variables were assessed using self-report questionnaires, making the findings potentially susceptible to response bias, social desirability, recall difficulties, and shared-method variance. Fourth, the study focused exclusively on women who had experienced unsuccessful

IVF, and the results therefore cannot necessarily be generalized to infertile women who had not undergone IVF, women who had successful IVF outcomes, or male partners. Finally, potentially influential clinical and contextual factors, including number of previous IVF failures, duration and cause of infertility, treatment costs, perceived partner support, socioeconomic status, and previous psychological treatment, were not comprehensively incorporated into the predictive model.

Future studies should use longitudinal designs to examine changes in psychological flexibility, attachment needs, alexithymia, and psychological distress across different stages of infertility treatment, including before IVF, during treatment, immediately following treatment outcome, and during subsequent adjustment. Prospective designs could clarify the temporal direction of the observed relationships and determine whether these psychological factors predict changes in distress over time. Future investigations should also recruit larger and more geographically diverse samples and include both women and their partners to examine dyadic influences within couples. Comparative research involving women with successful and unsuccessful IVF outcomes would help determine whether the observed psychological relationships are specific to treatment failure. Researchers may also examine mediating and moderating mechanisms, such as emotion regulation, perceived social support, infertility stigma, resilience, intolerance of uncertainty, marital satisfaction, and coping strategies. Finally, randomized intervention studies are needed to determine whether increasing psychological flexibility, strengthening attachment security, or improving emotional identification and expression leads to meaningful reductions in psychological distress following unsuccessful IVF.

Infertility clinics and assisted reproductive treatment centers should consider incorporating routine psychological screening into standard care, particularly after unsuccessful IVF cycles. Screening should assess not only symptoms of depression, anxiety, and stress but also difficulties with cognitive and psychological flexibility, unmet attachment-related needs, and problems identifying or expressing emotions. Women displaying elevated psychological vulnerability should be offered timely referral to psychological services integrated with reproductive care. Interventions may include techniques designed to increase acceptance of difficult experiences, enhance cognitive flexibility, reduce rigid and catastrophic interpretations, improve emotional awareness and labeling, and strengthen adaptive emotion regulation. Couple-based counseling may

also be useful when women report unmet attachment needs, insufficient partner responsiveness, or difficulties communicating treatment-related emotions. Training fertility healthcare professionals to recognize psychological distress and respond sensitively to emotional needs may further improve continuity of care. Integrating psychological and relational support with medical treatment may help women process unsuccessful IVF more adaptively, make subsequent treatment decisions with greater emotional stability, and reduce the likelihood that reproductive treatment failure develops into persistent psychological distress.

5. Conclusion

Overall, the findings extend previous evidence by demonstrating the value of psychological interventions for a specific and clinically relevant outcome among mastectomized women undergoing chemotherapy. Previous studies have demonstrated the effectiveness of mindfulness for psychosocial outcomes in breast cancer (Carlson et al., 2016; Dong et al., 2024), the importance of self-efficacy in pain adaptation (Asghari & Nicholas, 2001; Martinez-Calderon, 2018), the benefits of self-management interventions in cancer-related pain (Zhang et al., 2023), and the association between psychological adjustment and quality of life among women with breast cancer (Fallah et al., 2023). The present results integrate these lines of evidence by suggesting that enhancing broader quality-of-life resources and mindfulness-related coping can both strengthen women's beliefs about their ability to live and function despite cancer-related pain. The comparatively greater improvement associated with the Quality of Life Enrichment Package further suggests that multidimensional, disease-specific psychological interventions may be particularly useful when the treatment target is a complex construct such as pain self-efficacy.

6. Limitations and Suggestions

The present study should be interpreted in light of several limitations. First, the sample consisted of a relatively small number of mastectomized women undergoing chemotherapy who were recruited from a single cancer-support center in Mashhad, which limits the generalizability of the findings to women receiving care in other medical settings, geographic regions, cultural contexts, or stages of breast cancer treatment. Second, purposive sampling was used before random assignment, and therefore the sample may not fully

represent the broader population of women with breast cancer. Third, pain self-efficacy was assessed using a self-report questionnaire, meaning that responses may have been influenced by social desirability, current emotional state, subjective interpretation, or participants' expectations regarding the interventions. Fourth, the study focused on pain self-efficacy as the principal outcome and did not simultaneously assess objective functional activity, pain intensity, analgesic use, fatigue, depression, anxiety, sleep quality, or quality of life as potential explanatory or mediating variables. Fifth, although a three-month follow-up was included, this period remains relatively short for evaluating whether intervention effects are maintained throughout later stages of chemotherapy, recovery, or cancer survivorship. Finally, differences in therapist-related factors, group dynamics, participants' adherence to homework, and the frequency of mindfulness or self-care practice outside the intervention sessions may have influenced outcomes but were not examined systematically.

Future studies are recommended to replicate these findings using larger samples recruited from multiple oncology centers and different regions in order to improve external validity and determine whether similar effects are observed across diverse socioeconomic and cultural groups. Research could also compare the interventions in women at different stages of cancer treatment, including patients before surgery, during radiotherapy, after completion of chemotherapy, and in long-term survivorship. Longer follow-up periods of six months or one year would help clarify the durability of therapeutic gains. Future investigations should assess additional outcomes such as pain intensity, functional disability, cancer-related fatigue, body image, sexual functioning, sleep quality, depression, anxiety, hope, quality of life, and treatment adherence. Mediation analyses could be used to determine whether changes in emotional regulation, acceptance, self-compassion, health locus of control, sleep, or psychological adjustment explain improvements in pain self-efficacy. It would also be useful to investigate whether baseline variables such as disease stage, severity of pain, time since mastectomy, chemotherapy regimen, marital status, social support, or previous psychological treatment moderate intervention effectiveness. Comparative studies involving combined or sequential administration of the Quality of Life Enrichment Package and Mindfulness-Based Cancer Recovery may further determine whether an integrated protocol produces stronger or more sustained benefits than either intervention alone.

The findings suggest that psycho-oncology services should consider incorporating structured psychological interventions into routine supportive care for women undergoing chemotherapy after mastectomy. The Quality of Life Enrichment Package may be particularly useful when patients present with multiple interconnected difficulties involving mood, anxiety, body image, cognitive complaints, sleep, intimate relationships, loss of meaning, and reduced confidence in functioning despite pain. Mindfulness-Based Cancer Recovery can also be offered as a structured intervention for patients who experience high stress reactivity, persistent worry, difficulty tolerating physical sensations, or a tendency to become overwhelmed by pain-related thoughts. Oncology psychologists, counselors, nurses, and multidisciplinary cancer-care teams may benefit from screening patients for low pain self-efficacy and referring those with reduced confidence in daily functioning to appropriate psychosocial interventions. Clinical services should also encourage continued home practice, self-care, gradual activity, and post-intervention follow-up so that therapeutic skills become incorporated into patients' everyday routines. Integrating these approaches with medical pain management may provide a more comprehensive model of care in which symptom control is accompanied by strengthening patients' confidence, independence, and ability to maintain meaningful activities throughout cancer treatment.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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