

Effectiveness of Emotion-Focused Therapy Compared to Acceptance and Commitment Therapy on Health-Promoting Behaviors and Psychological Flexibility in Patients with Autoimmune Diseases: Investigating the Moderating Role of Age

Mojgan Omidbakhsh¹ (MSc), Afra Shahrabi Farahani² (MSc), Seyedeh Neda Amirnia³ (MSc), Kazem Rad⁴ (MSc), Masoumeh Alizadeh⁵ (MSc)

1. Department of Psychology, Refah University, Tehran, Iran
2. Department of Psychology, Faculty of Psychology, University of Tehran, Tehran, Iran
3. Department of Psychology, Bandar Abbas Branch, Islamic Azad University, Bandar Abbas, Iran
4. Department of Psychology, Torbat-e Jam Branch, Islamic Azad University, Torbat-e Jam, Iran
5. Department of Psychology, Urmia Branch, Islamic Azad University, Urmia, Iran

Submitted: 8 March 2026

Accepted: 6 April 2026

Int J Behav Sci. 2026; 20(1): 10-18

Corresponding Author:

Masoumeh Alizadeh,
Department of Psychology,
Urmia Branch,
Islamic Azad University,
Urmia,
Iran
E-mail: abinehdarman1400@gmail.com

Abstract

Introduction: The condition of patients with autoimmune diseases is critically influenced by the interaction between emotions, health-related behaviors, and psychological flexibility. This study aimed to compare the effectiveness of Emotion-Focused Therapy (EFT) and Acceptance and Commitment Therapy (ACT) on health-promoting behaviors and psychological flexibility in patients with autoimmune diseases, while examining the role of age as a moderator of change trajectories.

Method: This semi-experimental study employed a pre-test, post-test, and three-month follow-up design with three groups. The statistical population consisted of all patients aged 20 years and above with a confirmed diagnosis of autoimmune disease in Tehran between July and November 2024. The sample consisted of 45 participants selected purposively. The ACT group received eight 90-minute sessions and the EFT group received ten 90-minute sessions, twice a week. Instruments included the Health Promoting Lifestyle Profile (HPLP) and the Psychological Flexibility Questionnaire (PFQ). For statistical analyses, Kruskal-Wallis H test and repeated measures analysis of covariance were used.

Results: For psychological flexibility, the main group effect was non-significant ($p = 0.998$), showing no significant differences between the three groups. The time $\times$ group interaction was significant ($F = 4.25$, $p = 0.023$, $\eta^2 = 0.20$), indicating that changes in psychological flexibility over time varied according to treatment type. For health-promoting behaviors, the time $\times$ group interaction was highly significant ($F = 8.05$, $p = 0.001$, $\eta^2 = 0.32$), demonstrating greater efficacy of EFT and ACT compared to the control group. The time $\times$ age interaction was also significant ($F = 10.67$, $p = 0.003$, $\eta^2 = 0.24$).

Conclusion: Both EFT and ACT effectively induced meaningful changes in the trajectories of patients with autoimmune diseases, although the speed and nature of their effects differed.

Keywords: Emotion-Focused Therapy, Acceptance and Commitment Therapy, Health-Promoting Behaviors, Psychological Flexibility, Autoimmune Patients, Age

Introduction

Autoimmune diseases rank among the most important and complex chronic disorders of the modern era. They occur when the immune system, rather than protecting the body, erroneously targets healthy structures. These conditions encompass a wide range of illnesses, including rheumatoid arthritis, systemic lupus erythematosus, multiple sclerosis, celiac disease, inflammatory bowel diseases, Hashimoto's thyroiditis, and myasthenia gravis. In recent years, their prevalence has shown an upward trend, with some studies reporting

global rates between 3% and 9% of the population [1]. In addition to their physical burden, many patients face fluctuating symptom patterns and unpredictable disease courses, making management and psychological adaptation more challenging. Common symptoms such as inflammation, widespread pain, chronic fatigue, mobility restrictions, and functional impairments lead to reduced quality of life, disrupted social roles, and decreased participation in daily activities [2]. Recent qualitative studies have shown that autoimmune patients not only endure the physical toll of the disease but also face persistent challenges in managing emotions, making sense of their illness experience, and sustaining hope [3]. The chronic and relapsing nature of these conditions often erodes individuals' sense of control over their lives, triggering profound psychological distress [1-3].

The psychological dimensions of autoimmune diseases are as critical as their physical outcomes. Symptom fluctuation and unpredictability are directly linked to heightened anxiety, depression, emotional exhaustion, and feelings of helplessness [4]. Research indicates that psychological flexibility, the ability to adapt to unpleasant experiences while remaining committed to personal values—, is a key determinant of quality of life in chronic illnesses, including autoimmune disorders [5]. Reduced flexibility not only hinders symptom management but also exacerbates stress, emotional dysregulation, and reliance on maladaptive coping strategies. Alongside psychological factors, health-promoting behaviors play a vital role in controlling symptoms and preventing disease progression. Behaviors such as regular physical activity, healthy nutrition, stress management, treatment adherence, sufficient sleep, and self-care directly influence inflammation reduction, immune system regulation, and clinical outcomes. However, many autoimmune patients, due to pain, fatigue, and emotional instability, struggle to sustain these behaviors. Addressing such behaviors is therefore a critical focus in integrated and comprehensive care for these patients [6,7].

In recent years, innovative psychological interventions have emerged, focusing on emotional processing, acceptance of illness experiences, and enhancement of psychological flexibility [8]. Among them, Emotion-Focused Therapy (EFT) is recognized as a highly effective approach for helping chronic patients process complex, disease-related emotions and reconstruct maladaptive emotional patterns [9,10]. By addressing both primary and secondary emotions, EFT assists patients in finding meaning in their illness experience and regulating emotional responses [8]. This intervention is particularly suitable for those struggling with experiential openness, grief over lost health, or difficulty managing illness-related emotions. Conversely, Acceptance and Commitment Therapy (ACT) is a process-based approach aimed at increasing psychological flexibility, fostering acceptance of uncontrollable experiences, and promoting value-driven action. Evidence shows ACT's considerable effectiveness in improving emotion regulation and health-oriented behaviors in patients with diabetes, cardiovascular diseases, and autoimmune disorders [9–

11]. Studies in the domains of chronic pain and physical illness also indicate that ACT reduces experiential avoidance and increases adherence to beneficial health behaviors [8-11].

Despite a substantial body of research on EFT and ACT, few studies have directly compared these interventions in autoimmune populations. Most existing work examines a single outcome—such as depression, anxiety, or emotion regulation—rather than their simultaneous impact on crucial, co-occurring outcomes such as health-promoting behaviors and psychological flexibility. This represents a noteworthy gap in the current literature. Moreover, an important but often overlooked factor in psychological intervention research is the role of age in determining treatment effectiveness. Findings suggest that individuals at different life stages employ varied strategies for emotional processing, decision-making, and illness management [12]. Some studies emphasize that age may influence therapeutic responsiveness, motivation levels, and patterns of health-oriented behavior [13]. Consequently, analyzing the moderating role of age in psychological interventions for autoimmune patients can open new pathways for developing more targeted treatments, a topic almost entirely absent from current investigations. Addressing these gaps, the present study aims to compare the effectiveness of EFT and ACT in enhancing health-promoting behaviors and psychological flexibility in patients with autoimmune diseases, while examining the moderating effect of age. This research is novel not only in its direct comparison of two powerful psychotherapeutic approaches but also in its simultaneous focus on two critical yet understudied outcomes, health-oriented behavior and flexibility, and in its explicit analysis of age as a factor influencing intervention response. The expected findings may pave the way for designing more effective, personalized, and demographically aligned interventions, contributing to improved quality of life, self-care, and psychological well-being in autoimmune patients. Furthermore, these results could inform the development of age-responsive therapeutic models and integrated approaches within healthcare systems.

Method

This study employed a quasi-experimental design with a three-month follow-up, involving three groups: two intervention groups, EFT and ACT, —and a control group. The statistical population consisted of all patients aged 20-50 years with a confirmed diagnosis of autoimmune disease in Tehran between July and November 2024. Diagnosis was verified by specialists at the clinical center where the study was conducted.

A purposive sampling strategy was applied to select 45 autoimmune patients, who were then randomly assigned (via envelope draw method in which participants selected numbers from a sealed packet) into two intervention groups and one control group (15 participants per group). Sample adequacy was confirmed using G*Power, setting $\alpha = 0.05$, effect size = 0.80, and statistical power = 0.95 [14]. Similarly, although the allocation of participants to

groups was randomized, due to practical limitations in clinical sampling and lack of complete control of experimental conditions, the study did not meet the characteristics of a full-scale Randomized Controlled Trial (RCT). Therefore, the adapted CONSORT elements were used in reporting the research steps solely to increase transparency in the recruitment, allocation and follow-up of participants, and not as a claim to have conducted a full-scale RCT.

Inclusion criteria were: age ≥ 20 years, sufficient physical and mental health to attend intervention sessions, and possession of medical records confirming autoimmune disease diagnosis. Exclusion criteria included: presence of any psychiatric disorder, use of psychotropic medication, or absence from more than one therapy session (which resulted in withdrawal from the study).

Following approval from the relevant ethics committees and the host university, researchers attended two hospitals in Tehran, identified eligible autoimmune patients purposively, explained the study objectives and ethical principles in an initial interview, addressed participants' questions, and obtained written informed consent. Participants were then randomly allocated to ACT, EFT, or control group. The names of the hospitals

were withheld to preserve institutional confidentiality and to comply with ethical committee requirements, ensuring the anonymity of participating centers and protecting participants' privacy.

The ACT group received eight 90-minute sessions, twice weekly, whereas the EFT group received ten 90-minute sessions, also twice weekly. Session content for each intervention strictly adhered to its established protocol: EFT was delivered following Greenberg's (2004) training manual [15], an approach previously applied in Iranian research contexts [16], with details summarized in Table 1. ACT was administered according to Hayes et al. (2012) [17], summarized in Table 2. The control group received no intervention during the study and was placed on a waiting list; upon study completion, they were offered a condensed combined ACT/EFT course for ethical compliance.

All sessions were held in dedicated training rooms at one of the selected hospitals, depending on the conditions for holding the sessions. At the end of the final session in each intervention group, post-test measurements were collected using the study's questionnaires. Participant allocation and study flow are presented in the CONSORT diagram (Figure 1).

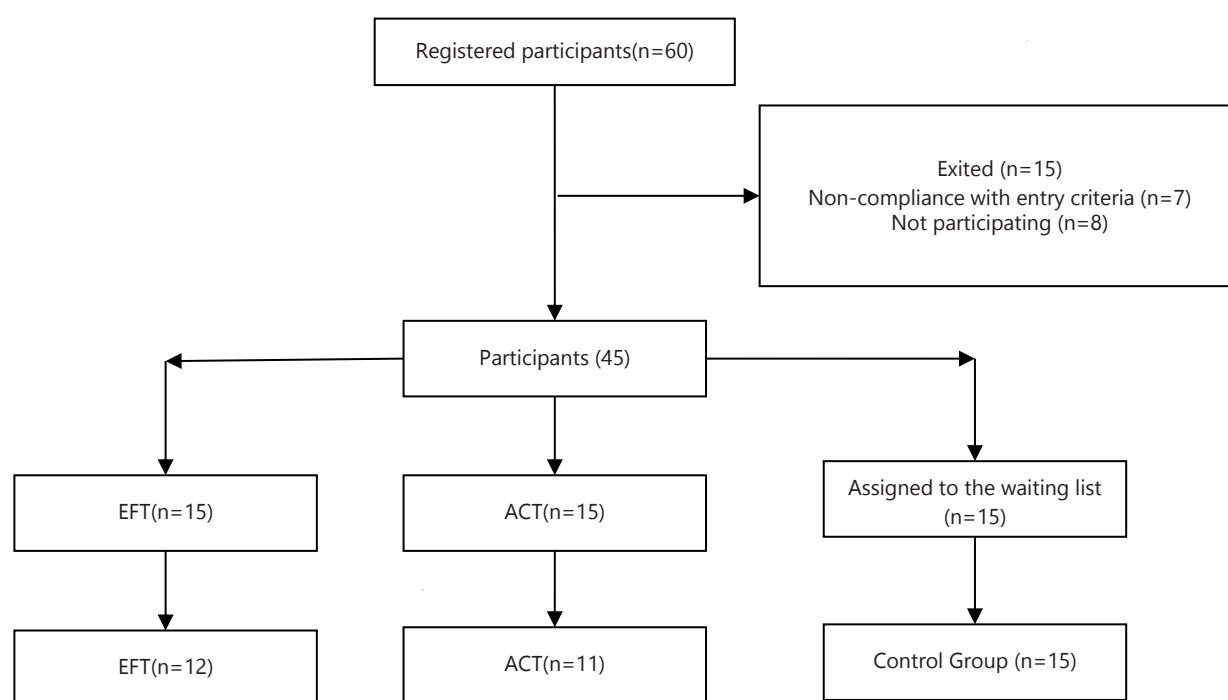


Figure 1. The flow diagram of the study.

The tools used in this study were as follows:

Health-Promoting Lifestyle Profile (HPLP): The Health-Promoting Lifestyle Profile (HPLP) was developed by Walker et al. to measure the frequency of health-promoting behaviors [18]. It consists of 49 items covering six subscales: nutrition, physical activity, health responsibility, stress management, interpersonal relations, and spiritual growth. Responses are rated on a four-point Likert scale (1 = Never, 2 = Sometimes, 3 = Often, 4 = Routinely), yielding a total score range of 49–196, with higher scores reflecting more frequent engagement in health-promoting behaviors. Walker

(1996) reported a Cronbach's alpha of 0.94 for the total scale. In an Iranian validation study, alpha was 0.87. In the Hill-Polerecky study in 1996, the Cronbach's alpha coefficient for the total score was found to be 0.94. Also, in the Cho study in 2014, the Cronbach's alpha of the scale was found to be 0.91. Based on the study by Mohammadi Zaidi et al., the factor analysis conducted in Iran confirmed the validity of the six-factor model and the model fit indices were approved. In this study, three questions were removed due to low factor loadings and the number of questions was reduced from 52 to 49 [19]. In the current study, Cronbach's alpha for the total scale was 0.71. Given

the clinical and heterogeneous nature of the research sample, Cronbach's alpha values above 0.70 were considered acceptable. In behavioral and clinical science research, reliability coefficients in the range of 0.70–0.80 indicate acceptable internal consistency.

Psychological Flexibility Questionnaire (PFQ): The Psychological Flexibility Questionnaire was developed by Ben-Itzhak et al. (2014) to assess psychological flexibility [20]. It includes 24 items representing five subscales: (1) Positive interpretation of change, (2) Viewing self as flexible, (3) Viewing self as open and creative, (4) Viewing reality as dynamic and changeable, and (5) Viewing reality as multifaceted. Items are rated on a six-point Likert scale (1 = Never to 6 = Very often), producing a total score range of 24–124; higher scores indicate greater psychological flexibility. The original developers reported Cronbach's alpha = 0.91, with subscale alphas ranging 0.77–0.89. The validity of the scale was acceptable based on the results of exploratory and confirmatory factor

analysis of the psychological flexibility questionnaire in students. In total, the questionnaire factors accounted for 59.83% of the variance. The model fit indices were also approved. The GFI was 0.90, the CFI was 0.91, and the NFI and NNFI were 0.92 and 0.89, respectively. Similarly, the AGFI and RMSEA indices were 0.93 and 0.07 [21]. In the present study, alpha was 0.77.

Data were analyzed using IBM SPSS Statistics v27. Descriptive statistics (mean, standard deviation) were calculated at pre-test, post-test, and three-month follow-up. Group homogeneity at baseline was examined with the Kruskal–Wallis H test. Repeated-measures ANCOVA (RM-ANCOVA) was used to examine time $\times$ group interaction effects on dependent variables, with Bonferroni post-hoc comparisons for within-group and between-group differences. Levene's test assessed homogeneity of variances, with statistical significance set at $p < 0.05$.

Table 1. Summary of Emotion-Focused Therapy Sessions

Session	Main Focus	Key Content
1	Introduction and framework	Establishing rapport; treatment goals and ACT framework; assessment of physical and psychological symptoms; education on emotion–body interaction in autoimmune illness.
2	Awareness of experiences	Recognition and acceptance of emotional and bodily experiences; observing thoughts; daily monitoring; mindful attention to symptoms.
3	Acceptance and defusion	Nonjudgmental acceptance; cognitive defusion; mindfulness and relaxation; strengthening the observing self; reducing cognitive entanglement.
4	Values clarification	Identification of personal values; values statement; linking values to daily life; age-sensitive emphasis on growth or acceptance.
5	Committed action	Small value-based actions; behavioral activation; self-care, physical activity, nutrition, and social connection; age-adjusted pacing.
6	Managing difficulties	ACT strategies for difficult thoughts and emotions; use of metaphors; acceptance of unpleasant experiences; stress tolerance.
7	Symptom integration	Applying ACT skills to physical symptoms; mindfulness and breathing; anxiety-reduction exercises; health-promoting behaviors.
8	Consolidation and follow-up	Review of progress; psychological flexibility; goal setting; relapse prevention and continuation planning.

Table 2. Summary of ACT Sessions

Session	Main Focus	Key Content
1	Introduction and framework	Rapport building; treatment goals and ACT framework; assessment of physical and psychological symptoms; education on autoimmune illness and emotion–body interaction.
2	Awareness of experiences	Recognition and acceptance of emotional and bodily experiences; observing thoughts; daily monitoring; mindful attention to symptoms.
3	Acceptance and defusion	Nonjudgmental acceptance; cognitive defusion; mindfulness and relaxation; strengthening the observing self; reducing cognitive entanglement.
4	Values clarification	Identification of personal values; values statement; linking values to daily life; age-sensitive emphasis on growth or acceptance.
5	Committed action	Small value-based actions; behavioral activation; self-care, activity, nutrition, and social connection; age-adjusted pacing.
6	Managing difficulties	ACT strategies for difficult thoughts and emotions; metaphors; acceptance of unpleasant experiences; stress tolerance.
7	Symptom integration	Applying ACT to physical symptoms; mindfulness and breathing; anxiety-reduction exercises; health-promoting behaviors.
8	Consolidation and follow-up	Review of progress; psychological flexibility; goal setting; relapse prevention and continuation planning.

Results

In this study, participants were categorized by gender (male and female). Regarding marital status, the highest proportion in all three groups consisted of single individuals: 41.7% in the EFT group, 45.5% in the ACT group, and 53.3% in the control group. The percentages of married participants were 50%, 36.4%, and 40% respectively, and the number of divorced participants was minimal. Educational level distributions were also similar across the three groups, with no notable differences. Overall, the groups were demographically comparable at baseline.

Table 4 presents the means and standard deviations of the study variables across the three groups. As shown, the groups (EFT, ACT, and control) had similar psychological flexibility scores at pre-test, indicating no meaningful baseline differences. However, in both the post-test and follow-up phases, both intervention groups showed higher psychological flexibility scores compared to the control group, while the control group exhibited no notable change over time.

A similar pattern was observed for health-promoting behaviors. At pre-test and post-test, the mean scores of

the three groups were relatively comparable. Nevertheless, in both the post-test and follow-up assessments, the EFT and ACT groups demonstrated increased health-promoting behavior scores relative to the control group, whereas the control group showed no meaningful change across the measurement phases. The results of the Levene test for homogeneity of variances showed that in the psychological flexibility variable, the assumption of equality of variances was violated in both the post-test ($F=5.04$, $p=0.012$) and follow-up ($F=6.24$, $p=0.005$) stages. In contrast, for the health-promoting behaviors variable, the assumption of homogeneity of variances was valid in the post-test stage ($F=0.42$, $p=0.657$), and in the follow-up stage, the test value was confirmed at the level ($F=3.26$, $p=0.051$).

According to the ANCOVA results presented in Table 6, the effects of the interventions on participants' health-promoting behaviors and psychological flexibility were examined while controlling the pre-test scores and evaluating age as a potential moderator. The findings are summarized across the *Between-Subjects* and *Within-Subjects* effects.

Table 3. Demographic Characteristics in the Experimental and Control Groups

Variables	Demographic information	EFT		ACT		Control		Total		Kruskal-Wallis H	P
		N	%	N	%	N	%	N	%		
Marital status	Single	5	41.7%	5	45.5%	8	53.3%	18	47.4%	0.48	0.784
	Married	6	50.0%	4	36.4%	6	40.0%	16	42.1%		
	Divorced	1	8.3%	2	18.2%	1	6.7%	4	10.5%		
Education	Diploma	6	50.0%	5	45.5%	7	46.7%	18	47.4%	0.17	0.914
	Bachelor	3	25.0%	2	18.2%	3	20.0%	8	21.1%		
	Master	3	25.0%	4	36.4%	5	33.3%	12	31.6%		
Gender	Man	6	50.0%	6	54.5%	6	40.0%	18	47.4%	0.57	0.751
	Woman	6	50.0%	5	45.5%	9	60.0%	20	52.6%		

Table 4. Description of Research Variables

Variable	TIME	Groups	N	Mean	SD	Min	Max	Skewness	Kurtosis
Psychological Flexibility	Pre-test	EFT	12	68.50	4.03	62	74	-0.41	-1.18
		ACT	11	68.72	4.07	62	74	-0.58	-0.92
		Control	15	68.53	4.82	62	74	-0.33	-1.87
	Post-test	EFT	12	75.91	1.08	75	78	1.22	0.67
		ACT	11	79.27	0.90	78	80	-0.64	-1.54
		Control	15	70.33	3.37	62	74	-1.47	2.09
	Follow-up	EFT	12	76.16	0.93	75	78	0.41	-0.29
		ACT	11	83.36	1.74	81	86	0.41	-1.23
		Control	15	70.13	4.01	62	74	-1.14	0.12
Health Promoting	Pre-test	EFT	12	97.41	1.83	94	100	-0.53	-0.64
		ACT	11	97.36	2.54	94	102	-0.007	-0.34
		Control	15	96.93	1.71	94	100	0.11	-0.76
	Post-test	EFT	12	102.83	1.80	100	105	0.07	-1.38
		ACT	11	100.72	1.61	99	103	0.19	-1.63
		Control	15	97.06	1.90	94	100	0.17	-1.19
	Follow-up	EFT	12	105.83	1.99	103	109	-0.13	-1.21
		ACT	11	102.09	1.51	100	105	0.23	-0.13
		Control	15	97.20	2.14	94	100	0.10	-1.69

Table 5. Covariance Analysis Test

Variable		Source	SS	MS	F	P	Eta Squared
Psychological flexibility	Within Subjects Effects	TIME	0.01	0.01	0.003	0.954	1.02×10 ⁻⁴
		TIME * Group	40.42	20.21	4.25	0.023	0.20
		TIME * Pre-test	1.13	1.13	0.24	0.627	0.007
		TIME * Age	1.83	1.83	0.38	0.538	0.01
	Between Subjects Effects	Group	0.02	0.01	0.002	0.998	1.07×10 ⁻⁴
		Pre-test	17.48	17.48	2.25	0.144	0.06
		Age	1.17	1.17	0.15	0.700	0.005
		Group * Age	30.06	15.03	1.93	0.161	0.11
	Welch	Post-test	533.77	266.88	65.79	< .001	0.74
		Follow up	1112.39	556.19	95.65	< .001	0.80
Health Promoting	Within Subjects Effects	TIME	0.12	0.12	0.07	0.793	0.002
		TIME * Group	28.13	14.06	8.05	0.001	0.32
		TIME * Pre-test	1.26	1.26	0.72	0.400	0.02
		TIME * Age	18.64	18.64	10.67	0.003	0.24
	Between Subjects Effects	Group	78.004	39.002	9.30	< .001	0.37
		Pre-test	5.98	5.98	1.42	0.241	0.04
		Age	6.03	6.03	1.43	0.239	0.04
		Group * Age	28.06	14.03	3.34	0.048	0.17

For psychological flexibility, the Between-Subjects main effect of group was not significant ($p=0.998$), indicating no overall difference between the EFT, ACT, and control groups when pre-test scores were held constant. The group $\times$ age interaction showed a trend toward significance ($F=1.93$, $p=0.161$, $\eta^2=0.11$), although it did not reach the threshold for statistical significance; this suggests only a potential directional indication of age-related moderation. Moreover, the Within-Subjects main effect of time was also non-significant ($F=0.003$, $p=0.954$), demonstrating no meaningful overall change across the three measurement points. However, the time $\times$ group interaction was significant ($F=4.25$, $p=0.023$, $\eta^2=0.20$), indicating that the two therapies (EFT and ACT) produced distinct longitudinal change patterns compared to the control group. Other interactions, including time $\times$ pre-test ($p=0.627$) and time $\times$ age ($p=0.538$), were not significant, showing no direct moderating effect of age on changes in psychological flexibility.

The lack of significance of the main effect of group in the analysis of covariance means that when the overall group means are considered simultaneously at all measurement times and controlling for pretest scores, no significant overall difference is observed. However, the significance of the time $\times$ group interaction indicates that the pattern of changes in the variables over time was not the same across groups. Therefore, post-test comparisons at each time point (e.g., post-test and follow-up) reveal significant differences that are not reflected in the main effect of group. These findings highlight the dynamic nature of the intervention effect and the importance of analyses based on repeated measures and interactions.

In contrast, the findings for health-promoting behaviors revealed a markedly different pattern. The time $\times$ group interaction was highly significant ($F=8.05$, $p=0.001$, $\eta^2=0.32$), indicating substantial differences in behavioral change trajectories across the three groups and confirming superior effectiveness of both EFT and ACT relative to the control group. Additionally, the time $\times$ age interaction was significant ($F=10.67$, $p=0.003$, $\eta^2=0.24$), clearly demonstrating that age played a notable

moderating role in participants' behavioral improvements, with different age groups responding differently to the interventions.

Table 7 presents the Bonferroni-adjusted post-hoc pairwise comparisons between the three groups (EFT, ACT, and control) for the two main outcome variables. The findings show that almost all differences between the intervention groups and the control group are statistically significant and in line with the study hypotheses. Both EFT and ACT produced significant and lasting improvements in the dependent variables during both post-test and follow-up.

For health-promoting behaviors, the EFT group had a significantly higher mean score than the control group at both post-test ($M_{diff}=6.29$, $p<.001$) and follow-up stages ($M_{diff}=6.45$, $p<.001$). Although the ACT group also showed a significant difference from the control group at follow-up ($M_{diff}=2.98$, $p=0.041$), the effect was smaller compared to EFT. This indicates that EFT had a stronger and more durable effect on health-promoting behaviors, though both therapies were effective.

For psychological flexibility, the pattern was different: ACT outperformed both EFT and the control group. While EFT was significantly better than the control group at post-test ($M_{diff}=5.58$, $p<.001$), ACT showed an even greater difference ($M_{diff}=8.92$, $p<.001$). This superiority of ACT persisted at follow-up, ACT had a significantly higher mean score not only compared to control, but also compared to EFT ($M_{diff}=-7.17$, $p<.001$; the negative difference indicates ACT's higher mean). Therefore, ACT provided more robust and lasting improvements in psychological flexibility than EFT.

Age was interpreted as a moderating variable only for health-promoting behaviors, where the time $\times$ age interaction reached statistical significance. For psychological flexibility, neither the time $\times$ age nor the group $\times$ age interactions were significant; therefore, no moderating role of age was inferred for this outcome. This approach avoids overgeneralization and ensures that moderation effects are discussed strictly based on statistically supported findings.

Table 7. Bonferroni's Post Hoc Test

		Mean Difference	SE	t	p _{bonf}	
Health Promoting	EFT, Post-test	ACT, Post-test	3.47	1.15	3.01	0.074
		Control, Post-test	6.29	0.72	8.64	< .001
		EFT, Follow-up	-1.67	0.67	-2.50	0.262
		ACT, Follow-up	0.25	1.11	0.23	1.000
		Control, Follow-up	6.45	0.77	8.33	< .001
	ACT, Post-test	Control, Post-test	2.81	0.92	3.03	0.070
		EFT, Follow-up	-5.14	1.09	-4.69	< .001
		ACT, Follow-up	-3.21	0.80	-4.003	0.005
		Control, Follow-up	2.98	0.92	3.23	0.041
	Control, Post-test	EFT, Follow-up	-7.96	0.79	-10.01	< .001
		ACT, Follow-up	-6.03	0.95	-6.30	< .001
		Control, Follow-up	0.16	0.49	0.33	1.000
	EFT, Follow up	ACT, Follow-up	1.93	1.25	1.54	1.000
		Control, Follow-up	8.13	0.79	10.27	< .001
	ACT, Follow-up	Control, Follow-up	6.19	1.01	6.13	< .001
psychological flexibility	EFT, Post-test	ACT, Post-test	-3.33	0.94	-3.52	0.019
		Control, Post-test	5.58	0.87	6.35	< .001
		EFT, Follow-up	-0.25	0.88	-0.28	1.000
		ACT, Follow up	-7.42	1.05	-7.02	< .001
		Control, Follow up	5.78	0.96	5.99	< .001
	ACT, Post-test	Control, Post-test	8.92	0.90	9.90	< .001
		EFT, Follow up	3.08	1.04	2.94	0.087
		ACT, Follow up	-4.08	0.92	-4.43	0.001
		Control, Follow-up	9.12	0.98	9.25	< .001
	Control, Post-test	EFT, Follow-up	-5.83	0.98	-5.92	< .001
		ACT, Follow-up	-13.009	1.01	-12.81	< .001
		Control, Follow-up	0.19	0.78	0.25	1.000
	EFT, Follow-up	ACT, Follow-up	-7.17	1.14	-6.25	< .001
		Control, Follow-up	6.03	1.06	5.67	< .001
	ACT, Follow-up	Control, Follow- up	13.20	1.09	12.10	< .001

Discussion

The present study aimed to compare the effectiveness of EFT and ACT on health-promoting behaviors and psychological flexibility among patients with autoimmune diseases, and to examine the moderating role of age in the trajectory of change. To achieve this aim, longitudinal changes during the treatment and follow-up phases were analyzed to determine the extent to which the two interventions could activate emotional regulation processes and committed action in this population.

The findings indicated that although psychological flexibility showed an upward trend in both EFT and ACT groups, no significant between-group difference was observed. At first glance, this might be interpreted as a lack of intervention efficacy. However, a closer examination showed that the time $\times$ group interaction was significant, suggesting that although the absolute differences between groups had not yet reached a large magnitude, the developmental trajectories in the intervention groups differed substantially from the control group. This pattern is well-established in the literature on process-based therapies. Recent studies on EFT have shown that changes in emotional organization and primary emotion processing often emerge with temporal delay, because emotional processes first evolve at the level of experience and awareness before stabilizing into lasting improvements in psychological flexibility [8]. ACT research likewise suggests that components such as cognitive defusion and acceptance—unlike health-related

behaviors—tend to follow a delayed pattern and exert their primary effects through the temporal trajectory rather than immediate between-group contrasts [5]. Zarbo et al. also demonstrated that shifts in emotional organization in EFT occur across several phases, and secondary effects such as increased flexibility typically appear later [8]. Earlier findings likewise indicate that EFT first restructures the emotional system before cognitive-behavioral changes emerge [22].

In contrast, Wang's study on patients with chronic pain reported a somewhat inconsistent result, showing that ACT only improves psychological flexibility when baseline depression is low; otherwise, between-group differences diminish. This discrepancy can be explained by characteristics of the present sample: autoimmune patients generally exhibit higher levels of persistent distress, and thus changes in flexibility require a longer stabilization period [13]. Therefore, the non-significant main effect of group, alongside a significant time interaction, is fully consistent with theoretical models of both treatments and reflects subtle yet progressive changes among participants. Regarding health-promoting behaviors, the findings aligned closely with the existing literature and demonstrated a strongly significant time $\times$ group interaction. Bagheri et al. likewise reported that ACT can substantially improve behaviors such as exercise, healthy nutrition, and medication adherence even in short six- to eight-session interventions [9]. In EFT, accurate processing of primary emotions, reduction of

secondary emotions such as fear and shame, and increased emotional self-compassion help patients confront the “grief of lost health,” move beyond avoidance and passivity, and develop greater motivation for body-care and health behaviors [23, 24]. Thus, the significant time $\times$ group interaction is fully expected and reflects the behavioral efficacy of emotion-focused and acceptance-based interventions.

Li et al. reported that acceptance-based interventions in autoimmune patients produce behavioral changes more rapidly than cognitive changes [6]. Folkertsma further demonstrated that emotion-focused interventions such as EFT reduce behavioral avoidance—particularly through reducing shame and fear—and thereby enhance health-promoting behaviors [24]. The present findings regarding improvement in health-promoting behaviors and the gradual increase in psychological flexibility—especially as patients shift from emotional avoidance toward active self-management—are strongly consistent with a previous study [25]. This previously mentioned study showed that patients with chronic illnesses and their caregivers consider interventions most effective when they foster not only behavioral skills but also deeper changes in emotional processing, regulation, and meaning-making. Because EFT activates primary emotional processing and ACT promotes acceptance and value-based action, the observed change pattern in this study directly reflects the mechanisms described in their “integrated emotion-and-acceptance-based self-management model.” This alignment further supports the conclusion that interventions simultaneously targeting emotional and motivational processes are most likely to produce sustained lifestyle change in individuals with chronic diseases—particularly autoimmune conditions with fluctuating symptom patterns [25]. Khayat-Abuaita et al. also found that EFT enhances patients’ capacity to engage with difficult emotions, which in turn improves adherence to health behaviors [22].

Concerning the moderating role of age, the behavioral change pattern observed in participants aged 35–40 was highly consistent with previous evidence. Agarwal reported that individuals in this age range show greater awareness of the physical consequences of autoimmune diseases and thus stronger motivation for lifestyle modification [12]. Folkertsma likewise referred to a “health motivation peak” in mid-adulthood that facilitates engagement in health-related behaviors [24]. Clark’s earlier study suggested that middle-aged adults demonstrate greater adherence to health behaviors due to more stable social and familial roles [26]. Mechanism analyses further reveal that in ACT, health behaviors are enhanced through committed action and value clarification—meaning individuals often initiate new actions before deeper cognitive shifts occur, and this behavioral activation gradually consolidates flexibility. In EFT, change begins with processing primary emotions; this reduces emotional avoidance and prepares individuals to adopt a healthier lifestyle. Accordingly, the differing rates of change in the variables are consistent not only with previous empirical findings but also with the

theoretical mechanisms of both approaches [27].

Conclusion

The findings demonstrated that both EFT and ACT produced significant developmental changes in patients with autoimmune diseases, although the pace and nature of change differed between the interventions. Health-promoting behaviors responded more quickly and robustly, whereas psychological flexibility—as a deeper and more enduring construct—followed a gradual trajectory, with between-group differences emerging primarily through temporal slopes. Age also moderated treatment effects, with early mid-adulthood (35–40 years) emerging as the period of greatest readiness for healthy lifestyle modification. Accordingly, both EFT and ACT approaches can be considered effective options for enhancing psychological functioning and lifestyle among autoimmune patients, though achieving stable improvements in flexibility may require longer treatment durations or booster sessions.

Despite a careful study design, several limitations must be acknowledged. The relatively small sample size and recruitment from a single clinical center limit generalizability. In addition, the absence of extended post-treatment follow-up prevented assessment of long-term stability, which is particularly important given the fluctuating nature of autoimmune symptoms. Furthermore, variables were primarily assessed using self-report questionnaires, which may be vulnerable to response bias. The disease severity and variation across autoimmune conditions were not controlled in the analytic model and may have influenced behavioral or emotional outcomes. These limitations emphasize the need for caution in generalizing the results. Future research should recruit larger and more diverse samples to allow stratified analysis across different autoimmune conditions. Regular follow-up sessions—for example, quarterly assessments—are strongly recommended to evaluate long-term sustainability of changes. Integrative EFT-ACT protocols should also be explored, given their complementary mechanisms targeting emotional processing and value-based action. Finally, future studies may incorporate biological indicators of inflammation, fatigue, or sleep quality to provide a more multidimensional understanding of the psychological treatment effects in autoimmune disorders.

Conflict of Interest

The authors declare no conflicts of interest.

Ethical Approval

Participants’ privacy and confidentiality were respected, and they were given the option to voluntarily participate or withdraw from the study at any time. The research was approved under the ethical code of IR.CTB.REC. 1403.201.

Declaration of Generative AI and AI-Assisted Technologies

During the preparation of this work, the authors did not use any AI tools.

Acknowledgment

The authors would like to express their sincere gratitude to all the individuals who contributed to the execution of this research.

References

1. Silva-Ribeiro S, Godinho CA, Camilo C, Marques MM, Chisari C, Segura Ú, Bernardes SF. Psychological, social and behavioural factors associated with disease/illness activity and adjustment to Lupus: a systematic review and meta-analysis. *Health Psychology Review*. 2025 Mar 26;1:35.
2. Klettner A, Luo S, Coyle LD, Liu N. A review of the link between psychological stress and inflammatory bowel disease exacerbation. *Academia Mental Health and Well-Being*. 2025 Mar 26;2(1).
3. Banafshi Z, Dehghan Nayeri N, Moghimi N, Khatony A. Exploring the self-care experiences of patients with rheumatoid arthritis through qualitative content analysis. *Scientific Reports*. 2025 Aug 26;15(1):31430.
4. Di Giuseppe M, Spatola C, Merlo EM, Silvestro O, Giorgianni CM, Juli G, Catalano A, Martino G. RESEARCH ADVANCES IN CLINICAL PSYCHOLOGY OF CHRONIC DISEASES. *Psychiatra Danubina*. 2025 Sep;37(Suppl 1):56-62.
5. Roberts MZ, Scheiber FA, Moskovich AA, Merwin RM. A Scoping Review of the Relationship Between Psychological (In) flexibility and Living with and Managing Type 1 and Type 2 Diabetes. *Behavioral Sciences*. 2025 Jun 9;15(6):792.
6. Li P, Li Y, He C, Wang H, Yin X, Jiang Y, Yin T. The Mediating Role of Patient Activation on the Relationship Between Social Support and Health-Promoting Behavior in Patients with Thyroid Cancer: A Cross-Sectional Study. *J Multidiscip Healthc*. 2025 Apr 16;18:2131-2140. doi: 10.2147/JMDH.S510415. PMID: 40260224; PMCID: PMC12010070.
7. Stout R, Reichert D, Kelly R, editors. *Lifestyle Medicine and the Primary Care Provider: A Practical Guide to Enabling Whole Person Care*. CRC Press; 2025 Jul 30. <https://doi.org/10.1201/9781032675794>
8. Zarbo C. "In health and sickness": the psychological distress of partners of women with a diagnosis of Endometriosis. *The Project PRENDOTE. MEDITERRANEAN JOURNAL OF CLINICAL PSYCHOLOGY*. 2024;12(S2):690-1. <https://boa.unimib.it/handle/10281/547517>
9. Bagheri M, Lotfi Kashani F, Ebrahimi MI. Comparing the Effects of Acceptance and Commitment Therapy and Reality Therapy on Improving Illness Perception in Women with Multiple Sclerosis. *Avicenna Journal of Neuro Psycho Physiology*. 2024 Sep 10;11(3):117-25. [10.32592/ajnp.2024.11.3.117](https://doi.org/10.32592/ajnp.2024.11.3.117)
10. Eisazadeh F, Rahimian-Boogar I. Effectiveness of Acceptance and Commitment Therapy on Physiological Measures in Patients with Type 2 Diabetes in Iran: A Systematic Review and Meta-Analysis: Systematic Review and Meta-Analysis of Acceptance and Commitment Therapy in Type 2 Diabetes. *International Journal of Applied Behavioral Sciences*. 2024;11(3):26-36. <https://doi.org/10.22037/ijabs.v11i3.46328>
11. Rahelić V, Perković T, Romić L, Perković P, Klobučar S, Pavić E, Rahelić D. The Role of Behavioral Factors on Chronic Diseases-Practice and Knowledge Gaps. *Healthcare (Basel)*. 2024 Dec 12;12(24):2520. doi: 10.3390/healthcare12242520. PMID: 39765947; PMCID: PMC11675894.
12. Agarwal U, Tonk RK. A Review of Mental Health: Epidemiology, Interventions, and Treatment Modalities. *Current Social Sciences*. 2025 Jan;3(1):E2772316X373662. DOI: [10.2174/012772316X373662250324051043](https://doi.org/10.2174/012772316X373662250324051043)
13. Wang Z, Song Y, Ou L, Liao D, He L, Ning Q, Chen Y, Chen H. Factors affecting patient activation among patients with systemic lupus erythematosus. *Scientific Reports*. 2024 Jan 18;14(1):1632.
14. Kang H. Sample size determination and power analysis using the G*Power software. *Journal of educational evaluation for health professions*. 2021 Jul 30;18. [10.3352/jeehp.2021.18.17](https://doi.org/10.3352/jeehp.2021.18.17)
15. Greenberg LS. Emotion-focused therapy. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice*. 2004 Jan;11(1):3-16. <https://doi.org/10.1002/cpp.388>
16. Mostajeran M, Jazayeri RS, Fatehizade M. The Effect of integrated Emotion-focused therapy (Grinbeerg's) and Compassion focused Therapy on Marital quality of Life and married women. *Research in Cognitive and Behavioral Sciences*. 2021 Aug 23;11(1):85-106. <https://doi.org/10.22108/cbs.2022.130801.1576>
17. Hayes SC, Pistorello J, Levin ME. Acceptance and commitment therapy as a unified model of behavior change. *The Counseling Psychologist*. 2012 Oct;40(7):976-1002. <https://doi.org/10.1177/0011000012460836>
18. Walker SN, Sechrist KR, Pender NJ. The health-promoting lifestyle profile: development and psychometric characteristics. *Nursing research*. 1987 Mar 1;36(2):76-81. <https://pubmed.ncbi.nlm.nih.gov/3644262/>
19. Sehati M, Ashayeri H, Doulatbadi S. Effectiveness of Cognitive-Behavioral Intervention on Adherence to Health Promotion Behaviors and Psychological Flexibility in Autoimmune (Psoriasis) Patients. *Medical Journal of Mashhad university of Medical Sciences*. 2020 Jul 22;63(3):2428-40. <https://doi.org/10.22038/mjms.2021.17838>
20. Ben-Itzhak S, Bluvstein I, Maor M. The psychological flexibility questionnaire (PFQ): Development, reliability and validity. 2014.
21. Safarzaei M, Ameri F, Mehrinejad SA, Peivastegar M, Khodabakhsh Pirkalani R. Psychometric properties of the Psychological Flexibility Questionnaire among students. *Journal of Research in Psychological*. 2020. URL: <http://rph.khu.ac.ir/article-1-3787-fa.html>
22. Khayyat-Abuaita U, Paivio S, Pascual-Leone A, Harrington S. Emotional processing of trauma narratives is a predictor of outcome in emotion-focused therapy for complex trauma. *Psychotherapy*. 2019 Dec;56(4):526.
23. Noorali Z, Khakpour R, Jahangir P. Comparison of the Effects of Acceptance and Commitment Therapy and Emotion-Focused Therapy on Mental Vitality in Caregivers of Elderly Parents. *Elderly Health Journal* 2024; 10 (2) :111-121. <http://ehj.ssu.ac.ir/article-1-330-en.html>
24. Folkertsma TS, Bos R, Vodegel RM, Bloem S, Liefveld AR, Tack GJ. Personalizing supportive healthcare for patients with immunological disorders. *medRxiv*. 2024 Apr 27:2024-04. <https://www.medrxiv.org/content/10.1101/2024.04.25.24306403v1.full.pdf>
25. Niño de Guzmán Quispe E, Martínez García L, Orrego Villagrán C, Heijmans M, Sunol R, Fraile-Navarro D, Pérez-Bracchiglione J, Ninov L, Salas-Gama K, Viteri García A, Alonso-Coello P. The Perspectives of Patients with Chronic Diseases and Their Caregivers on Self-Management Interventions: A Scoping Review of Reviews. *Patient*. 2021 Nov;14(6):719-740. doi: 10.1007/s40271-021-00514-2.
26. Clark PG, Greene GW, Blissmer BJ, Lees FD, Riebe DA, Stamm KE. Trajectories of Maintenance and Resilience in Healthful Eating and Exercise Behaviors in Older Adults. *J Aging Health*. 2019 Jun;31(5):861-882. doi: 10.1177/0898264317746264. Epub 2017 Dec 12. PMID: 29254440.
27. Eicher L, Knop M, Aszodi N, Senner S, French LE, Wollenberg A. A systematic review of factors influencing treatment adherence in chronic inflammatory skin disease - strategies for optimizing treatment outcome. *J Eur Acad Dermatol Venereol*. 2019 Dec;33(12):2253-2263. doi: 10.1111/jdv.15913. Epub 2019 Nov 14. PMID: 31454113.