



The Effectiveness of an Integrated Emotion-Focused Therapy and Music Therapy Package in Reducing Stress, Anxiety, and Depression among Adults with High-Functioning Autism Spectrum Disorder

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ABSTRACT

This study examined the preliminary effectiveness of an integrated therapeutic package combining emotion-focused therapy and music therapy in reducing stress, anxiety, and depression among adults with high-functioning autism spectrum disorder. A quasi-experimental pretest-posttest-follow-up design with a control group was used; after purposive eligibility screening, participants were allocated to groups using a simple random procedure. The population consisted of adults aged 18-45 years with autism spectrum disorder level 1, without intellectual disability, who attended psychological centers and private or semi-private clinics in Tehran, Iran, in 2025. Thirty adults were screened, and 27 eligible participants were selected through purposive sampling and allocated by simple random procedure to an experimental group (n = 14) or a control group (n = 13). The experimental group received 12 sessions of the integrated intervention over six weeks, with two 90-minute sessions per week; the control group received no study-delivered active psychological intervention during this period, while access to stable usual care was not restricted. Outcomes were measured using the Depression Anxiety Stress Scales-21 (DASS-21). Mixed-design repeated-measures analyses of variance showed significant time × group interactions for stress, $F(1.018, 25.447) = 77.285, p < .001$, partial eta squared = .756; anxiety, $F(1.007, 25.177) = 24.007, p < .001$, partial eta squared = .490; and depression, $F(1.011, 25.277) = 35.964, p < .001$, partial eta squared = .590. The experimental group showed substantial reductions from pretest to posttest, and these gains were observed at the six-month follow-up, although maintenance should be interpreted cautiously because treatments received during follow-up were not experimentally controlled. The findings suggest that an integrated emotion-focused and music-based intervention may be a useful structured approach for reducing internalizing symptoms in adults with high-functioning autism spectrum disorder.

Keywords: autism spectrum disorder; high-functioning autism; emotion-focused therapy; music therapy; stress; anxiety; depression.

1. Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by persistent differences in social communication and social interaction, together with restricted or repetitive patterns of

behavior, interests, or activities and atypical sensory processing (1). The DSM-5 framework consolidated previously separate diagnostic categories, including autistic disorder, Asperger's disorder, and pervasive developmental disorder not otherwise specified, into the single diagnosis of

ASD and introduced severity levels based on the amount of support required (2). Prevalence estimates vary across countries, diagnostic procedures, and demographic groups, but systematic review evidence indicates that ASD affects a substantial proportion of the population, with a median global prevalence of approximately 100 per 10,000 children (3). Beyond core autistic features, co-occurring psychiatric conditions are common, particularly anxiety and depressive disorders, making mental health a major clinical concern in autistic populations (4).

Adults with high-functioning ASD, operationalized in this study as adults with ASD level 1, adequate language ability, and no intellectual disability, constitute an important group for psychological intervention research. Although these adults may have preserved cognitive and language abilities, they can still experience clinically meaningful difficulties in emotion regulation, social interaction, daily functioning, and psychological well-being (1). Evidence on non-pharmacological randomized controlled trials for autistic adults remains limited and heterogeneous, with variability in intervention type, outcome selection, and methodological quality restricting firm conclusions about the most effective forms of support (5). Stress is a clinically relevant outcome in autistic adulthood. Perceived stress reflects the extent to which individuals experience daily circumstances as stressful and has been associated with poorer activities of daily living and lower subjective quality of life in autistic adults (6). Stress is also closely linked with emotion regulation difficulties and internalizing symptoms; perceived stress and emotion regulation challenges have been identified as mechanisms connecting camouflaging with anxiety and depression among autistic adults (7). Recent intervention research has therefore treated stress reduction as a meaningful target in this population (8).

Anxiety is another central mental health concern. Clinically significant anxiety is more common in autistic adults than in non-autistic adults and is associated with poorer quality of life and adverse functional outcomes (9). Qualitative evidence also indicates that anxiety may be experienced in autism-specific ways that are not fully captured by conventional non-autistic frameworks, supporting the need for adapted assessment and intervention approaches (10). Despite this need, relatively few studies have examined treatments for anxiety in autistic adults (9).

Depression is similarly important in autistic adulthood. Depressive symptoms are part of the broader psychiatric burden observed in autistic populations (4). Recent evidence indicates that depressive symptoms may have a particularly strong association with quality-of-life impairment in autistic adults (11). Depression in autistic individuals can also be associated with loneliness, reduced employment, lower quality of life, and suicidal ideation or attempts (12).

Emotion regulation has been proposed as a key process for understanding socioemotional and behavioral difficulties in ASD. Mazefsky et al. (2013) argued that amplified emotional responses and poor emotional control may provide a useful framework for understanding many socioemotional and behavioral problems in autism (13). Emotion dysregulation has also been associated with core autistic features, including social-communication difficulties, restricted or repetitive behaviors, and sensory abnormalities (14). In high-functioning autism, alexithymia and emotion regulation difficulties are commonly reported, and the serial relationship between alexithymia and emotion regulation has been shown to mediate associations between autistic features and depression and anxiety symptoms (15). Emotion-focused therapy (EFT) is therefore theoretically relevant to autistic adults with internalizing symptoms. EFT is an experiential, process-oriented approach that emphasizes emotion as a source of meaning, need, action tendency, and organization of personal experience (16). Its aim is not simply emotional suppression or symptom control, but access to emotional experience, symbolization of that experience, clarification of underlying needs, and transformation of maladaptive emotions into more adaptive emotional responses (16, 17). Adaptations of EFT for autistic processes have emphasized access to one's own and others' emotional experiences, emotional symbolization, activation and deepening of emotion, and movement toward adaptive emotions such as compassion (17). However, a solely verbal intervention may not be optimal for all autistic adults. Music therapy can provide a structured sensory, experiential, and nonverbal pathway for emotional expression and engagement. In autism-related intervention research, music therapy has been associated with potential benefits in global improvement, autism symptom severity, quality of life, social communication, and behavioral symptoms, although the literature remains heterogeneous

and is more developed for children than adults (18-20). Music-based activities such as guided listening, rhythm, singing, improvisation, and shared musical participation can offer a medium for emotional expression, regulation, communication, and interpersonal coordination.

Taken together, the evidence suggests that an integrated intervention combining EFT and music therapy may be clinically relevant for adults with high-functioning ASD. EFT offers a framework for emotional awareness, processing, and transformation, whereas music therapy provides a sensory and nonverbal channel for emotional access and regulation. Despite the relevance of stress, anxiety, and depression in autistic adults, little empirical work has examined the combined application of these two approaches in adults with high-functioning ASD. The present study therefore examined whether an integrated EFT and music therapy package could reduce stress, anxiety, and depression in this population. It was hypothesized that participants receiving the integrated intervention would show greater reductions from pretest to posttest and follow-up than participants in the control group.

2. Methods and Materials

2.1. Study Design

This study used a quasi-experimental pretest-posttest-follow-up design with a control group; the study was not a fully registered randomized clinical trial, but eligible participants were allocated to groups using a simple random procedure after purposive screening. The independent variable was the integrated therapeutic package based on emotion-focused therapy and music therapy. The dependent variables were stress, anxiety, and depression. Participants were assessed before the intervention, immediately after the intervention, and at a six-month follow-up. The experimental group received the integrated intervention, whereas the control group received no study-delivered active psychological intervention during the six-week intervention period and was not restricted from stable usual psychological or medical care already in place. Because the study used purposive sampling and had a modest sample size, the findings should be interpreted cautiously.

2.2. Participants and Sampling

The statistical population consisted of adults aged 18-45 years with high-functioning ASD, without intellectual disability, who attended psychological centers and private or semi-private clinics in Tehran, Iran, in 2025. High-functioning status was defined as a formal diagnosis of ASD level 1 by a psychiatrist or clinical psychologist based on DSM-5 clinical criteria and available clinical records, documented intellectual functioning above 85, and adequate language ability to participate in structured individual sessions and selected dyadic or small-group music-based activities when required by the protocol. Thirty adults were screened for eligibility. Twenty-seven eligible participants were selected through purposive sampling and were then randomly assigned to an experimental group ($n = 14$) or a control group ($n = 13$). Participants in both groups completed all three assessment phases.

2.3. Diagnostic Screening and Eligibility Criteria

Eligibility was determined based on a confirmed diagnosis of ASD level 1, absence of intellectual disability, documented intellectual functioning above 85 from clinical or psychometric records available at the recruiting centers, adequate language ability, and the ability to cooperate with assessment and intervention procedures. Inclusion criteria were age between 18 and 45 years, confirmed ASD level 1, high-functioning profile, willingness to participate, regular attendance, and completion of pretest, posttest, and six-month follow-up assessments. Exclusion criteria were absence from more than two intervention sessions, withdrawal of consent, incomplete questionnaire data, concurrent participation in another structured psychological intervention, severe psychiatric disorder requiring specialized treatment, acute psychological crisis during the study, or inability to cooperate with the therapeutic protocol. Diagnostic confirmation was based on specialist evaluation and available clinical documentation; no additional standardized autism diagnostic interview was administered as part of this study.

2.4. Measure

Depression Anxiety Stress Scales-21 (DASS-21). The DASS-21 is the short form of the Depression Anxiety Stress

Scales developed by (21). It is a 21-item self-report instrument designed to assess three negative emotional states: depression, anxiety, and stress. Each subscale includes seven items rated on a four-point Likert scale from 0 to 3. The recommended scoring procedure is to sum each seven-item subscale and multiply the score by two, allowing comparison with the original 42-item DASS and yielding a final score range of 0-42 for each subscale (21, 22). Higher scores indicate greater symptom severity. In this study, the stress, anxiety, and depression subscale scores were used as the primary outcomes.

2.5. Intervention Protocol

The experimental group received an integrated intervention based on EFT and music therapy; the package was primarily delivered in a structured session-based format, with selected dyadic or small-group music-making activities used only when clinically appropriate for the session objective. The package was delivered over six weeks in 12 sessions, with two 90-minute sessions per week (Table 1).

Each session included structured music-based activities, emotion-focused processing, emotional stabilization or relaxation, and home practice. The rationale was that music therapy could provide a sensory and nonverbal route to emotional access, while EFT could help participants identify, symbolize, process, and transform emotional experience. The music therapy component included guided listening, personal music selection, calming music, rhythmic or melodic improvisation, songwriting, shared listening, duet or small-group music-making, and emotion-regulation playlists. The EFT component included emotion identification, exploration of primary emotions, work with maladaptive emotions such as fear and shame, empty-chair or two-chair dialogue, identification of underlying emotional needs, transformation of maladaptive emotions into adaptive emotions, and consolidation of emotional change. The package was developed from established EFT principles and music-therapy techniques and was reviewed by the research team and clinical consultants for content consistency before implementation; sessions followed the same sequence and checklist to support treatment fidelity.

Table 1

Twelve-session integrated EFT and music therapy protocol

Session	Main objective	Music therapy techniques	EFT techniques	Home practice
1	Rapport, package introduction, and emotional safety	Listening to calming Iranian or international music and discussing the listening experience	Identifying and naming basic emotions	Creating a “today’s feeling” playlist
2	Increasing emotional awareness	Selecting preferred music and describing music-evoked emotions	Exploring emotion through questions such as “What are you feeling now?”	Daily emotion diary with music
3	Beginning emotional activation	Guided listening to happy and sad music	Exploring primary emotions beneath surface feelings	Writing a memory activated by music
4	Working with alexithymia and difficulty naming emotions	Sound- and rhythm-based warm-up expression	Therapist-assisted meaning-making: “What emotion does this rhythm sound like?”	Daily practice in naming emotions
5	Encountering maladaptive emotions such as fear and shame	Dramatic or tension-inducing music for emotional activation	Empty-chair dialogue with fear or shame	Selecting music that evokes courage or strength
6	Discovering underlying emotional needs	Simple songwriting or writing short lyrics over music	Exploring emotional needs: “What need does this song show?”	Completing “the song of my needs”
7	Transforming emotions	Empowering or rhythmic music	Transforming maladaptive fear into adaptive protective anger	Daily listening to empowering music
8	Working on interpersonal relationships	Duet or small-group music-making for coordination	Processing the here-and-now relational experience	Recording an empathy experience outside the session
9	Strengthening empathy and social communication	Shared listening and discussion of musical meaning	Two-chair dialogue with an imagined important person, with emphasis on empathy	Practicing empathy with a real person
10	Consolidating emotional changes	Reviewing favorite musical pieces from previous sessions	Reviewing the emotional change cycle from maladaptive to adaptive emotion	Creating a personal emotion-regulation playlist

11	Preparing for termination	Free improvisation and emotional expression through music	Meaning-making from the therapeutic process and reviewing achievements	Writing a letter to the future self with music
12	Review and closure	Final individual or clinically appropriate small-group-selected music performance/listening	Reviewing changes and consolidating therapeutic gains	Daily use of the emotion-regulation playlist

2.6. Statistical Analysis

Data were analyzed using IBM SPSS Statistics, version 26. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize demographic characteristics and DASS-21 scores. Because stress, anxiety, and depression were assessed at pretest, posttest, and follow-up, mixed-design repeated-measures analyses of variance were conducted. Time was entered as the within-subjects factor with three levels, and group was entered as the between-subjects factor with two levels. Levene's test was used to examine homogeneity of error variances. Mauchly's test was used to assess sphericity; when sphericity was violated, Greenhouse-Geisser corrected results were reported. Multivariate tests were also reported for the main effect of time and the time × group interaction.

Statistical significance was set at $p < .05$, and partial eta squared was reported as the effect size.

3. Findings and Results

3.1. Participant Characteristics

The study included 27 adults with high-functioning ASD who were assigned to a control group ($n = 13$) or an experimental group ($n = 14$). The control group included 6 men (46.2%) and 7 women (53.8%), whereas the experimental group included 6 men (42.9%) and 8 women (57.1%). Regarding marital status, 12 participants in the control group were single (92.3%) and 1 was married (7.7%); all participants in the experimental group were single. The mean age was 32.15 ± 4.10 years in the control group and 34.79 ± 3.29 years in the experimental group (Table 2).

Table 2

Demographic characteristics of participants by group

Characteristic	Control group ($n = 13$)	Experimental group ($n = 14$)
Age, $M \pm SD$	32.15 ± 4.10	34.79 ± 3.29
Age range	27-42	30-41
Male, n (%)	6 (46.2%)	6 (42.9%)
Female, n (%)	7 (53.8%)	8 (57.1%)
Single, n (%)	12 (92.3%)	14 (100.0%)
Married, n (%)	1 (7.7%)	0 (0.0%)

3.2. Descriptive Outcomes

Descriptive statistics for stress, anxiety, and depression at pretest, posttest, and follow-up are presented in Table 3. In the control group, mean scores remained relatively stable across the three assessment points. In the experimental group, all three outcomes showed marked reductions from

pretest to posttest, with effects maintained or slightly improved at follow-up. The repeated posttest and follow-up values in the control group indicate no recorded change between these two assessments in the available dataset; this should be interpreted as stability of recorded scores rather than an intervention effect.

Table 3

Descriptive statistics for stress, anxiety, and depression by group and time

Outcome	Group	Pretest $M \pm SD$	Posttest $M \pm SD$	Follow-up $M \pm SD$
Stress	Control	21.92 ± 2.10	22.23 ± 2.32	22.23 ± 2.32

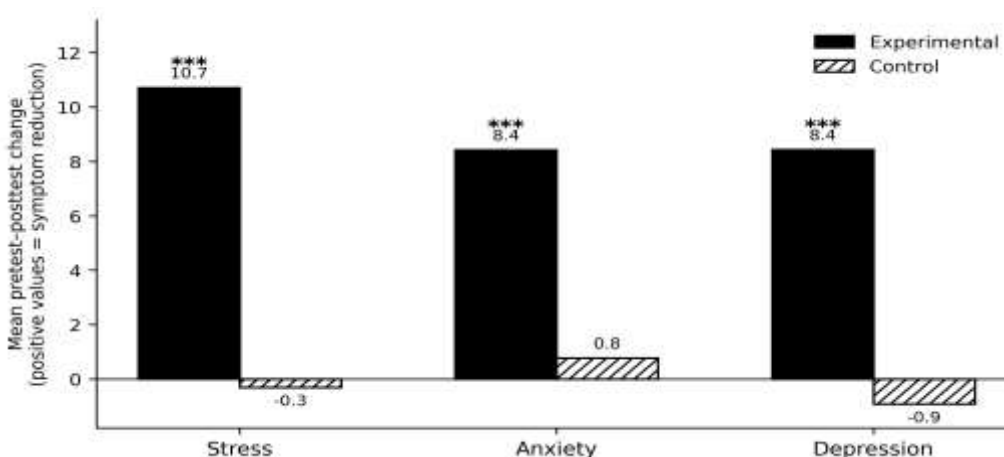
Stress	Experimental	25.21 ± 2.29	14.50 ± 2.47	13.93 ± 2.30
Anxiety	Control	21.77 ± 4.17	21.00 ± 3.42	21.00 ± 3.42
Anxiety	Experimental	22.21 ± 3.93	13.79 ± 2.55	13.00 ± 2.60
Depression	Control	20.77 ± 2.56	21.69 ± 2.06	21.69 ± 2.06
Depression	Experimental	21.64 ± 2.90	13.21 ± 4.61	12.64 ± 4.41

Figure 1 summarizes the pretest-to-posttest change scores for stress, anxiety, and depression. Positive values indicate symptom reduction. The experimental group showed

marked reductions across all outcomes, whereas the control group showed minimal change.

Figure 1

Mean pretest-to-posttest changes in DASS-21 stress, anxiety, and depression scores by group. Positive values indicate symptom reduction. Experimental bars are solid black; control bars are white with hatching. *** indicates a significant time × group interaction ($p < .001$) for the corresponding outcome.



3.3. Assumption Testing

As shown in Table 4, Levene's tests indicated that the homogeneity of error variances assumption was met for all

outcomes across pretest, posttest, and follow-up. Mauchly's test of sphericity was significant for stress, anxiety, and depression; therefore, Greenhouse-Geisser corrected results were reported for within-subjects effects.

Table 4

Assumption testing

Outcome	Levene pretest p	Levene posttest p	Levene follow-up p	Mauchly W	chi-square	p	Greenhouse-Geisser epsilon
Stress	.858	.416	.637	.035	80.390	< .001	.509
Anxiety	.946	.270	.251	.014	102.297	< .001	.504
Depression	.676	.077	.086	.022	91.660	< .001	.506

3.4. Repeated-Measures Analysis Results

As summarized in Table 5, for stress, the multivariate test showed a significant main effect of time, Pillai's trace = .804, $F(2, 24) = 49.234$, $p < .001$, partial eta squared = .804. The time × group interaction was also significant, Pillai's trace =

.817, $F(2, 24) = 53.721$, $p < .001$, partial eta squared = .817. Greenhouse-Geisser corrected univariate results confirmed a significant main effect of time, $F(1.018, 25.447) = 69.117$, $p < .001$, partial eta squared = .734, and a significant time × group interaction, $F(1.018, 25.447) = 77.285$, $p < .001$, partial eta squared = .756. The between-subjects effect of

group was significant, $F(1, 25) = 42.998, p < .001$, partial eta squared = .632.

For anxiety, the multivariate test showed a significant main effect of time, Pillai's trace = .709, $F(2, 24) = 29.189, p < .001$, partial eta squared = .709. The time \times group interaction was significant, Pillai's trace = .683, $F(2, 24) = 25.820, p < .001$, partial eta squared = .683. Greenhouse-Geisser corrected univariate results also showed a significant main effect of time, $F(1.007, 25.177) = 33.986, p < .001$, partial eta squared = .576, and a significant time \times group interaction, $F(1.007, 25.177) = 24.007, p < .001$, partial eta squared = .490. The between-subjects effect of group was significant, $F(1, 25) = 22.060, p < .001$, partial eta squared = .469.

For depression, the multivariate test showed a significant main effect of time, Pillai's trace = .679, $F(2, 24) = 25.335, p < .001$, partial eta squared = .679. The time \times group interaction was also significant, Pillai's trace = .733, $F(2, 24) = 32.932, p < .001$, partial eta squared = .733. Greenhouse-Geisser corrected univariate results confirmed a significant main effect of time, $F(1.011, 25.277) = 23.538, p < .001$, partial eta squared = .485, and a significant time \times group interaction, $F(1.011, 25.277) = 35.964, p < .001$, partial eta squared = .590. The between-subjects effect of group was significant, $F(1, 25) = 29.522, p < .001$, partial eta squared = .541.

Table 5

Repeated-measures analysis results

Outcome	Effect	Test	Statistic	F	df	p	Partial eta squared
Stress	Time	Pillai trace	.804	49.234	2, 24	< .001	.804
Stress	Time \times Group	Pillai trace	.817	53.721	2, 24	< .001	.817
Stress	Time	Greenhouse-Geisser	-	69.117	1.018, 25.447	< .001	.734
Stress	Time \times Group	Greenhouse-Geisser	-	77.285	1.018, 25.447	< .001	.756
Stress	Group	Between-subjects	-	42.998	1, 25	< .001	.632
Anxiety	Time	Pillai trace	.709	29.189	2, 24	< .001	.709
Anxiety	Time \times Group	Pillai trace	.683	25.820	2, 24	< .001	.683
Anxiety	Time	Greenhouse-Geisser	-	33.986	1.007, 25.177	< .001	.576
Anxiety	Time \times Group	Greenhouse-Geisser	-	24.007	1.007, 25.177	< .001	.490
Anxiety	Group	Between-subjects	-	22.060	1, 25	< .001	.469
Depression	Time	Pillai trace	.679	25.335	2, 24	< .001	.679
Depression	Time \times Group	Pillai trace	.733	32.932	2, 24	< .001	.733
Depression	Time	Greenhouse-Geisser	-	23.538	1.011, 25.277	< .001	.485
Depression	Time \times Group	Greenhouse-Geisser	-	35.964	1.011, 25.277	< .001	.590
Depression	Group	Between-subjects	-	29.522	1, 25	< .001	.541

3.5. Summary of Findings

Overall, the results showed significant time \times group interactions for stress, anxiety, and depression. The experimental group demonstrated substantial reductions in all three outcomes from pretest to posttest, and these reductions were maintained or slightly improved at follow-up. In contrast, the control group showed little or no

improvement across the same period. These findings provide preliminary support for the effectiveness of the integrated EFT and music therapy package in reducing stress, anxiety, and depression among adults with high-functioning ASD.

4. Discussion

This study examined the preliminary effectiveness of an integrated therapeutic package based on EFT and music therapy in reducing stress, anxiety, and depression among adults with high-functioning ASD. The findings showed that participants who received the integrated intervention experienced reductions in all three outcomes after the intervention, and similar improvements were observed at the six-month follow-up; however, the maintenance of gains should be interpreted cautiously because additional treatment exposure during follow-up was not experimentally controlled. These results suggest that the integrated package may be a useful structured approach for addressing internalizing symptoms in adults with high-functioning ASD. Because autistic adults frequently experience co-occurring mental health problems and because adult-focused psychosocial intervention evidence remains limited, the findings have clinical relevance for psychological and rehabilitation services (1, 4, 5).

The reduction in stress may be understood in relation to the emotional and regulatory focus of the intervention. Stress in autistic adults has been associated with difficulties in daily functioning, subjective quality of life, and emotion regulation challenges (6, 7). In the present intervention, participants engaged in emotional awareness tasks, music-based regulation, relaxation or emotional stabilization, emotion diaries, and emotion-regulation playlists. These elements are consistent with evidence emphasizing the role of emotion regulation and self-compassion in autistic adults' mental health (23, 24).

The reduction in anxiety is also consistent with the clinical need for adapted interventions for autistic adults. Anxiety is common and clinically important in autistic adulthood, yet the evidence base for anxiety-focused interventions in autistic adults remains limited (9). In this intervention, anxiety-related emotional experiences were not addressed only through verbal dialogue. Instead, the package combined music-based emotional activation, calming musical experiences, emotional labeling, and emotion-focused processing. This multimodal format may be useful because preserved language ability can coexist with difficulties in emotional expression, interpersonal communication, and regulation of internal states (1).

The reduction in depression is clinically meaningful because depressive symptoms are strongly associated with quality-of-life impairment in autistic adults (11). The package included therapeutic tasks focused on accessing emotional experience, identifying needs, expressing emotions through music, developing self-compassion, and consolidating emotional change. These components are consistent with EFT principles, which emphasize emotional awareness, symbolization, and transformation of maladaptive emotional responses (19, 25). The improvement in depression may therefore be interpreted as consistent with an intervention model that directly targets emotional processing while supporting expression through both verbal and nonverbal pathways.

The clinical value of the integrated package may lie in the complementarity of its two therapeutic pathways. EFT provides a structured framework for emotional access, meaning-making, processing, and transformation, whereas music therapy provides a sensory, experiential, and nonverbal medium for emotional expression and engagement. Music therapy has shown potential benefits in autism-related intervention research, including global improvement and some social-communication outcomes, although evidence remains heterogeneous across outcomes, designs, and populations (18-20). For adults with high-functioning ASD, a combined model may be especially relevant because emotional difficulties may remain clinically significant even when cognitive and verbal abilities are relatively preserved.

Several limitations should be considered. The final sample was small and selected through purposive sampling from psychological centers and private or semi-private clinics in Tehran; therefore, the findings may not generalize to autistic adults in other regions, non-clinical communities, or individuals with different support needs. The control group received no study-delivered active psychological intervention, so nonspecific effects such as therapist attention, expectancy, structured weekly contact, and possible continuation of usual care cannot be fully ruled out. Outcomes were based on self-report measures, which may be influenced by emotional awareness, response style, or self-perception. Although the study included a six-month follow-up, longer follow-up periods are needed to evaluate durability. Future studies should use larger and more diverse

samples, randomized controlled designs with active comparison conditions, clinician-rated and functional outcomes, quality-of-life measures, emotion-regulation measures, and treatment fidelity assessments. In addition, although six-month follow-up data were collected, psychotherapy or support services received during the follow-up interval were not experimentally controlled, which limits causal interpretation of maintenance effects. The intervention package also requires further validation through independent expert review, fidelity monitoring, and replication in larger trials.

5. Conclusion

The present study showed preliminary evidence that an integrated therapeutic package based on EFT and music therapy may be effective in reducing stress, anxiety, and depression among adults with high-functioning ASD, with improvements observed at a six-month follow-up. The intervention combined emotional processing with music-based emotional expression and regulation in a structured session-based format. These findings suggest that the integrated approach may be a useful psychological intervention for reducing internalizing symptoms in adults with high-functioning ASD. Because of the small sample, purposive sampling, and inactive control condition, the findings should be regarded as preliminary and should be confirmed through larger randomized controlled studies.

Authors' Contributions

Hossein Fayazmanesh contributed to conceptualization, investigation, intervention implementation, data collection, data curation, and preparation of the initial manuscript draft. Kouros Amraei contributed to conceptualization, methodology, supervision, project administration, interpretation of findings, and critical revision of the manuscript. Fatemeh Rezaei contributed to methodology, clinical and theoretical consultation, validation of the intervention content, interpretation of findings, and critical review of the manuscript. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for the integrity and accuracy of the work.

Declaration

Language-editing assistance was used to improve clarity, grammar, and formatting. The authors remain fully responsible for the scientific content, accuracy of the analyses, interpretation of the findings, and final manuscript.

Transparency Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

All procedures were planned and implemented in accordance with ethical standards for human-subject research. Participants were informed about the study objectives, procedures, potential benefits and risks, confidentiality protections, voluntary participation, and the right to withdraw without penalty. Written informed consent was obtained before data collection. Given the emotional nature of the intervention, participants were monitored for distress, and referral to specialized services was available when needed. Data were anonymized and reported only in aggregate form. Participation in the study did not restrict access to usual psychological or medical care. Participants were also advised to report any new psychological or psychiatric treatment received during the follow-up period, although such services were not experimentally controlled.

References

1. Schweizer T, Endres D, Dziobek I, Tebartz van Elst L. Psychosocial therapeutic approaches for high-functioning autistic

- adults. *Frontiers in Psychiatry*. 2024;14(Article 1265066). [PMID: 38274434] [PMCID: PMC10808656] [DOI]
2. Posar A, Visconti P. Autism spectrum disorder and the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5): The experience of 10 years. *Turkish Archives of Pediatrics*. 2023;58(6):658-9. [DOI]
 3. Zeidan J, Fombonne E, Scora J, Ibrahim A, Durkin MS, Saxena S, et al. Global prevalence of autism: A systematic review update. *Autism Research*. 2022;15(5):778-90. [PMID: 35238171] [PMCID: PMC9310578] [DOI]
 4. Hossain MM, Khan N, Sultana A, Ma P, McKyer ELJ, Ahmed HU, et al. Prevalence of comorbid psychiatric disorders among people with autism spectrum disorder: An umbrella review of systematic reviews and meta-analyses. *Psychiatry Research*. 2020;287(Article 112922). [PMID: 32203749] [DOI]
 5. Speyer R, Chen YW, Kim JH, Wilkes-Gillan S, Nordahl-Hansen AJ, Wu HC, et al. Non-pharmacological interventions for adults with autism: A systematic review of randomised controlled trials. *Review Journal of Autism and Developmental Disorders*. 2022;9:249-79. [DOI]
 6. McQuaid GA, Weiss CH, Said AJ, Pelphrey KA, Lee NR, Wallace GL. Increased perceived stress is negatively associated with activities of daily living and subjective quality of life in younger, middle, and older autistic adults. *Autism Research*. 2022;15(8):1535-49. [PMID: 35790082] [PMCID: PMC9545671] [DOI]
 7. McQuaid GA, Lee NR, Wallace GL. An examination of perceived stress and emotion regulation challenges as mediators of associations between camouflaging and internalizing symptomatology among autistic adults. *Autism in Adulthood*. 2024;6(3):345-61. [PMID: 39371362] [PMCID: PMC11447396] [DOI]
 8. Hoerberichts K, Roke Y, Niks I, van Harten PN. The effect of the Stress Autism Mate app on perceived stress, coping, and resilience in adults with autism: A single-case experimental design. *Frontiers in Psychiatry*. 2024;15(Article 1347947). [PMID: PMC11210387] [DOI]
 9. Menezes M, Harkins C, Robinson MF, Pappagianopoulos J, Cross R, Vasa RA, et al. Treatment of anxiety in autistic adults: A systematic review. *Research in Autism Spectrum Disorders*. 2022;99(Article 102068). [DOI]
 10. Da Silva AB, Berry E, Craig S, Doumas M. A systematic review of autistic adults' experiences of anxiety from a qualitative perspective. *Journal of Autism and Developmental Disorders*. 2025. [DOI]
 11. Thiel T, Riedelbauch S, Gaigg SB, Roessner V, Ring M. The impact of depressive and anxious symptoms on quality of life in adults on the autism spectrum. *Autism Research*. 2024;17(6):1161-74. [PMID: 38783834] [DOI]
 12. Hinze E, Paynter J, Dargue N, Adams D. The presentation of depression in depressed autistic individuals: A systematic review. *Review Journal of Autism and Developmental Disorders*. 2024. [DOI]
 13. Mazefsky CA, Herrington J, Siegel M, Scarpa A, Maddox BB, Scahill L, et al. The role of emotion regulation in autism spectrum disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2013;52(7):679-88. [PMID: 23800481] [PMCID: PMC3719386] [DOI]
 14. Samson AC, Phillips JM, Parker KJ, Shah S, Gross JJ, Hardan AY. Emotion dysregulation and the core features of autism spectrum disorder. *Journal of Autism and Developmental Disorders*. 2014;44(7):1766-72. [PMID: 24362795] [DOI]
 15. Morie KP, Jackson S, Zhai ZW, Potenza MN, Dritschel B. Mood disorders in high-functioning autism: The importance of alexithymia and emotional regulation. *Journal of Autism and Developmental Disorders*. 2019;49(7):2935-45. [PMID: 31028592] [PMCID: PMC7375152] [DOI]
 16. Greenberg LS. Emotion-focused therapy: A clinical synthesis. *Focus*. 2010;8(1):32-42. [DOI]
 17. Robinson A, Elliott R. Emotion-focused therapy for clients with autistic process. *Person-Centered & Experiential Psychotherapies*. 2017;16(3):215-35. [DOI]
 18. Gao X, Xu G, Fu N, Ben Q, Wang L, Bu X. The effectiveness of music therapy in improving behavioral symptoms among children with autism spectrum disorders: A systematic review and meta-analysis. *Frontiers in Psychiatry*. 2025;15(Article 1511920). [PMID: 39896995] [PMCID: PMC11783185] [DOI]
 19. Geretseger M, Fusar-Poli L, Elefant C, Mössler KA, Vitale G, Gold C. Music therapy for autistic people. *Cochrane Database of Systematic Reviews*. 2022;2022(5). [PMID: 35532041] [PMCID: PMC9082683] [DOI]
 20. Shi Z, Wang S, Chen M, Hu A, Long Q, Lee Y. The effect of music therapy on language communication and social skills in children with autism spectrum disorder: A systematic review and meta-analysis. *Frontiers in Psychology*. 2024;15(Article 1336421). [PMID: 38774719] [PMCID: PMC11106491] [DOI]
 21. Lovibond SH, Lovibond PF. *Manual for the Depression Anxiety Stress Scales*: Psychology Foundation of Australia; 1995. [DOI]
 22. Moya E, Larson LM, Stewart RC, Fisher J, Mwangi MN, Phiri KS. Reliability and validity of depression anxiety stress scale (DASS)-21 in screening for common mental disorders among postpartum women in Malawi. *BMC Psychiatry*. 2022;22(Article 352). [PMID: 35606733] [PMCID: PMC9128196] [DOI]
 23. Cai RY, Love AMA, Robinson A, Gibbs V. The inter-relationship of emotion regulation, self-compassion, and mental health in autistic adults. *Autism in Adulthood*. 2023;5(3):335-42. [PMID: 37663445] [PMCID: PMC10468559] [DOI]
 24. Cai RY, Samson AC. A non-systematic overview review of self-focused emotion regulation in autistic individuals through the lens of the extended process model. *Autism*. 2025;29(5):1118-28. [PMID: 39773230] [PMCID: PMC12038066] [DOI]
 25. Timulak L, Keogh D, McElvaney J, Schmitt S, Hession N, Timulakova K, et al. Emotion-focused therapy as a transdiagnostic treatment for depression, anxiety and related disorders: Protocol for an initial feasibility randomised control trial. *HRB Open Research*. 2020;3(Article 7). [PMID: 32296754] [PMCID: PMC7140776] [DOI]