

# Comparison of the Effectiveness of Positive Thinking Training and Emotional Self-Regulation Training on Self-Compassion and Psychological Well-Being in Mothers of Children with Autism Spectrum Disorder

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### ABSTRACT

The present study was conducted with the aim of comparing the effectiveness of positive thinking training and emotional self-regulation training on self-compassion and psychological well-being in mothers of children with Autism Spectrum Disorder (ASD). This study was a quasi-experimental design with a pretest–posttest control group and a two-month follow-up. The statistical population consisted of mothers of children with ASD in the city of Isfahan during the years 2024–2025. From this population, 60 mothers were selected through purposive sampling and were then randomly assigned to two experimental groups and one control group. The research instruments included the Self-Compassion Scale (Neff, 2003) and the Psychological Well-Being Questionnaire (Ryff, 2002). Both experimental groups received interventions consisting of eight 90-minute sessions of positive thinking training and emotional self-regulation training. Data were analyzed using repeated measures analysis of variance (ANOVA) and Bonferroni post hoc tests. The results indicated that positive thinking training and emotional self-regulation training had a significant effect on parenting stress and distress tolerance ( $p < 0.001$ ). The effects of both interventions were maintained at the two-month follow-up stage. Furthermore, emotional self-regulation training demonstrated greater effectiveness compared to positive thinking training in improving self-compassion and psychological well-being ( $p < 0.001$ ). The findings suggest that therapists should prioritize emotional self-regulation training over positive thinking training to enhance self-compassion and psychological well-being in mothers of children with ASD.

**Keywords:** self-compassion, psychological well-being, emotional self-regulation, positive thinking, autism spectrum disorder

## 1. Introduction

Mothers of children with Autism Spectrum Disorder (ASD) represent a population exposed to sustained psychological demands, chronic caregiving stress, and heightened vulnerability to mental health difficulties, making them a critical target for psychological interventions aimed at improving well-being and adaptive functioning. Empirical evidence consistently indicates that caregiving in the context of ASD is associated with elevated levels of stress, anxiety, depression, and emotional exhaustion, largely due to the complex behavioral, communicative, and developmental needs of children with ASD, as well as social stigma and reduced access to support systems (Curtis & Izett, 2025; Martin et al., 2025). Qualitative and phenomenological studies further highlight that mothers often experience persistent emotional strain, identity challenges, and feelings of isolation, which can undermine their psychological well-being and caregiving efficacy (Oppenheim et al., 2025; Ramos-Serrano, 2025). Moreover, recent intervention-based research has demonstrated that parenting stress and emotional dysregulation are central mechanisms influencing maternal mental health in this population, emphasizing the need for targeted psychosocial interventions (Xiang et al., 2025; Yan & Abdullah, 2025).

Within the framework of positive psychology, constructs such as self-compassion and psychological well-being have emerged as key protective factors that can buffer the negative psychological impact of caregiving stress. Self-compassion, conceptualized as a balanced and non-judgmental attitude toward oneself during times of suffering, has been shown to play a significant role in reducing self-criticism, enhancing emotional resilience, and promoting adaptive coping strategies (Anderson & Miller, 2024; Vidal et al., 2024). Theoretical and empirical models suggest that self-compassion operates through mechanisms such as emotional regulation, cognitive flexibility, and reduced absolutist thinking, thereby contributing to improved mental health outcomes (Büyüköksüz & Kayaalp-pehlivan, 2025; Nguyen et al., 2025). Additionally, self-compassion has been linked to broader indicators of psychological well-being, including life satisfaction, positive affect, and psychological capital, reinforcing its central role in mental health promotion (Huang et al., 2025; Kavehfarsani et al., 2020).

Psychological well-being itself is a multidimensional construct encompassing autonomy, environmental mastery, personal growth, positive relationships, purpose in life, and

self-acceptance. Research indicates that higher levels of psychological well-being are associated with better emotional adjustment, reduced vulnerability to psychopathology, and enhanced quality of life across diverse populations (Wild et al., 2025). In the context of mothers of children with ASD, psychological well-being is often compromised due to chronic stressors; however, it can be significantly improved through interventions targeting emotional and cognitive processes (Xiang et al., 2025; Yan & Abdullah, 2025). Importantly, recent studies have emphasized the interrelationship between self-compassion, emotion regulation, and psychological well-being, suggesting that interventions addressing these domains simultaneously may yield optimal outcomes (Rehman et al., 2024; Rezagholiyan et al., 2025).

Positive thinking training represents one such intervention rooted in cognitive-behavioral and positive psychology principles, focusing on restructuring maladaptive cognitions, enhancing optimism, and promoting positive interpretations of life events. Evidence from experimental and quasi-experimental studies indicates that positive thinking interventions can significantly improve emotional well-being, reduce psychological distress, and enhance cognitive flexibility (Basurrah et al., 2023; Saghebi et al., 2020). Positive thinking is also closely linked to constructs such as optimism and social adjustment, which mediate its effects on psychological outcomes (Golestani Bakht et al., 2022; Uzun & Karataş, 2023). Moreover, optimism-based interventions have been shown to reduce depressive symptoms and enhance self-compassion by shifting individuals' cognitive focus toward adaptive and constructive perspectives (Shapira & Mongrain, 2010). Despite these benefits, some studies suggest that the effectiveness of positive thinking may be limited when underlying emotional regulation difficulties are not addressed, highlighting the importance of integrating emotion-focused approaches (Anderson & Miller, 2024).

In parallel, emotional self-regulation training has gained substantial attention as a transdiagnostic intervention targeting the underlying mechanisms of emotional dysfunction. Emotional self-regulation involves the ability to monitor, evaluate, and modify emotional responses in adaptive ways, and deficits in this domain have been strongly associated with a wide range of psychological disorders (Büyüköksüz & Kayaalp-pehlivan, 2025; Nguyen et al., 2025). Interventions focusing on emotional regulation aim to enhance awareness of emotional experiences, reduce maladaptive coping strategies such as avoidance and

suppression, and promote cognitive reappraisal and acceptance-based strategies. Empirical findings indicate that emotional regulation training significantly improves mental health outcomes, including reductions in anxiety, depression, and stress, as well as increases in psychological well-being and resilience (Matiz et al., 2025; Rehman et al., 2024). Furthermore, emotional regulation has been identified as a key mediator in the relationship between self-compassion and mental health, suggesting that improvements in emotional regulation may enhance the effectiveness of interventions targeting self-compassion (Fooladchang & Davoud, 2025; Rezagholiyan et al., 2025).

Recent integrative models highlight the dynamic interplay between self-compassion, emotion regulation, and cognitive processes in determining psychological outcomes. For instance, studies have shown that individuals with higher levels of self-compassion exhibit greater emotional flexibility, lower levels of cognitive distortions, and improved coping strategies, all of which contribute to enhanced psychological well-being (Uzun & Karataş, 2023; Vidal et al., 2024). Similarly, emotion regulation strategies such as cognitive reappraisal and mindfulness have been linked to increased self-compassion and reduced emotional distress, reinforcing the interconnected nature of these constructs (Cutajar & Bates, 2025; Wild et al., 2025). In applied settings, interventions that simultaneously target cognitive restructuring and emotional regulation processes have demonstrated superior effectiveness compared to single-component approaches (Matiz et al., 2025; Rehman et al., 2024).

Despite the growing body of literature on positive thinking and emotional regulation interventions, there remains a need for comparative studies examining their relative effectiveness, particularly in high-risk populations such as mothers of children with ASD. While both approaches have demonstrated efficacy in improving mental health outcomes, their mechanisms of action differ, with positive thinking primarily targeting cognitive processes and emotional regulation addressing both cognitive and affective components. Understanding the comparative impact of these interventions can inform the development of more targeted and efficient therapeutic programs tailored to the specific needs of this population (Büyükoğuz & Kayaalp-pehlivan, 2025; Nguyen et al., 2025). Additionally, cultural and contextual factors may influence the effectiveness of these interventions, underscoring the importance of conducting research in diverse settings (Basurrah et al., 2023; Rehman et al., 2024).

In sum, the existing literature underscores the importance of self-compassion and psychological well-being as central components of mental health, particularly among mothers of children with ASD, and highlights the potential of positive thinking and emotional self-regulation interventions in enhancing these outcomes. However, there is a notable gap in comparative research examining the relative efficacy of these interventions within this specific population, which limits the ability of practitioners to make evidence-based decisions regarding intervention selection. Therefore, the present study aimed to compare the effectiveness of positive thinking training and emotional self-regulation training on self-compassion and psychological well-being in mothers of children with Autism Spectrum Disorder.

## 2. Methods and Materials

### 2.1. Study Design and Participants

The present study was a quasi-experimental design with a pretest–posttest control group and a two-month follow-up period. The statistical population included all mothers of children with Autism Spectrum Disorder (ASD) in the city of Isfahan during the years 2024–2025. In this study, 60 mothers of children with ASD were selected using purposive sampling and were then randomly assigned to two experimental groups (experimental group 1: 20 participants; experimental group 2: 20 participants) and one control group (20 participants).

To implement the study, after obtaining the necessary permissions and informed consent from the mothers, educational interventions were conducted for both experimental groups, while no intervention was provided for the control group. At the end of the intervention, the questionnaires were administered again (posttest), and finally, a follow-up assessment was conducted after two months.

Inclusion criteria included mothers whose children had previously been diagnosed with ASD by specialists using standardized tools and tests in the relevant centers, were receiving training in those centers, had not received any other simultaneous educational intervention, and had completed informed consent forms. Exclusion criteria included incomplete questionnaire responses and unwillingness to continue participation in the training sessions. Ethical considerations such as confidentiality of collected data, obtaining informed consent, non-disclosure of participants' information, and the right to withdraw from the study at any time were strictly observed.

## 2.2. Measures

**Psychological Well-Being Questionnaire:** This scale was developed by Ryff (1980). The original form consisted of 120 items; however, shorter versions with 84, 54, and 18 items were developed in subsequent studies. In the present study, the 18-item version was used, which was originally developed by Ryff (1989) and revised in 2002. Ryff designed various forms of the Psychological Well-Being Scales, including 20-item, 14-item, 9-item, and 3-item versions, and after preliminary evaluations, the main version containing 84 items was developed (Ryff, 1989). Subsequently, the 54-item version and the short 18-item form were created. This version includes six dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Responses to each item are rated on a six-point Likert scale ranging from “strongly disagree” to “strongly agree.” The dimensions are defined as follows: self-acceptance refers to having a positive attitude toward oneself and accepting various aspects of the self, including both strengths and weaknesses, as well as having a positive evaluation of one’s past life; positive relations with others refer to satisfaction and intimacy in interpersonal relationships and understanding the importance of these connections; autonomy reflects independence and self-determination in life events and active engagement in behaviors; environmental mastery refers to the ability to manage and control external activities and effectively utilize surrounding opportunities; purpose in life involves having goals and a sense of meaning in both present and past life; and personal growth reflects a sense of continuous development and openness to new experiences as an individual with potential capacities. The 18-item short form assesses these six core components, with each subscale consisting of three items. Specifically, items 1, 4, and 6 measure environmental mastery; items 2, 8, and 10 measure self-acceptance; items 3, 11, and 13 assess positive relations with others; items 5, 14, and 16 measure purpose in life; items 7, 15, and 17 assess personal growth; and items 9, 12, and 18 measure autonomy. Items 3, 4, 5, 9, 10, 13, 16, and 17 are reverse-scored, while the remaining items are scored directly. Higher scores indicate better psychological well-being. In the study by Shokri et al., Cronbach’s alpha coefficients for each of the psychological well-being subscales were reported as significant. Additionally, Jowshanlou et al. (2009) reported Cronbach’s alpha

coefficients ranging from 0.77 to 0.90 and confirmed the scale’s validity.

**Self-Compassion Questionnaire:** The Self-Compassion Scale consists of 26 items designed to measure three main components: self-kindness (5 items) versus self-judgment (5 items), common humanity (4 items) versus isolation (4 items), and mindfulness (4 items) versus over-identification (4 items), developed by Neff (2003). Items are rated on a five-point Likert scale ranging from “almost never” (1) to “almost always” (5), with higher scores indicating higher levels of self-compassion. Items 1, 4, 8, 9, 11, and 12 are reverse-scored. In the study by Shahbazi et al. (2015), a short 12-item version of the scale was used, consisting of six subscales with two items each, developed by Raes et al. (2011). The Cronbach’s alpha coefficient for the total scale was reported as 0.91. Additionally, Cronbach’s alpha coefficients for the subscales of self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification were reported as 0.83, 0.87, 0.91, 0.88, 0.92, and 0.77, respectively. Concurrent and convergent validity of the questionnaire were also reported as satisfactory.

## 2.3. Interventions

The positive thinking training protocol was implemented based on the framework proposed by Khodayari et al. (2016) and was conducted over eight weekly group sessions, each lasting 90 minutes. The intervention focused on enhancing participants’ awareness of their personal strengths, fostering optimism, and promoting a positive cognitive orientation toward themselves, others, and life events. The program began with establishing rapport, introducing group members, explaining the study objectives, and administering the pretest. Subsequent sessions included training in identifying personal strengths, setting life goals, and recognizing factors contributing to a healthy lifestyle, along with developing positive beliefs. Participants were trained in optimism skills, including evaluating automatic thoughts and replacing negative cognitions with constructive alternatives. The intervention further emphasized cultivating a positive perception of others by identifying strengths in family members, friends, and colleagues. Participants were encouraged to recall and share positive life experiences, analyze their beneficial aspects, and reinforce positive self-talk through cognitive restructuring techniques. Later sessions involved prioritizing personal strengths, providing evidence for these strengths, and applying them to problem-

solving. The final session focused on sustaining a positive lifestyle, including maintaining mental and physical health, fostering effective interpersonal relationships, and enhancing control over life events. Homework assignments throughout the program included self-reflection exercises, journaling strengths and positive experiences, and practicing cognitive and behavioral techniques to reinforce positive thinking patterns.

The emotional self-regulation training protocol was based on the unified transdiagnostic treatment approach developed by Allen and Barlow (2009), and its effectiveness for mothers has been supported in the Iranian context by Amani et al. (2020). This intervention was delivered in eight weekly group sessions of 90 minutes each and aimed to enhance emotional awareness, regulation, and cognitive flexibility. The program began with group introduction, clarification of objectives, and administration of the pretest, followed by an overview of the importance of emotion regulation. Early sessions focused on understanding maladaptive emotions, recognizing emotional disorders, and identifying cognitive, physiological, and behavioral components of emotional responses, including common cognitive distortions. Participants were trained to monitor and record their negative emotions systematically. Subsequent sessions addressed the relationship between emotions, thoughts, and behaviors, emphasizing the identification of automatic thoughts and maladaptive interpretations, and promoting cognitive flexibility through reappraisal techniques. The

intervention also targeted emotion-driven behaviors, highlighting the consequences of emotional avoidance versus emotional experience and expression. Participants engaged in experiential exercises involving emotional exposure, interoceptive awareness, and reduction of avoidance behaviors, along with systematic self-monitoring. Later sessions focused on identifying core beliefs related to themes such as rejection and helplessness and understanding their role in emotional dysregulation. The final session emphasized restructuring maladaptive core beliefs, replacing them with more adaptive alternatives, summarizing therapeutic content, and administering the posttest. Homework assignments included self-monitoring forms, emotional awareness exercises, and cognitive restructuring tasks to consolidate learned skills.

#### 2.4. Data analysis

For data analysis, repeated measures analysis of variance (ANOVA) was used, and analyses were conducted using SPSS version 26.

### 3. Findings and Results

Based on the demographic information, the mean and standard deviation of participants' age were 32.19 in the positive thinking training group, 34.74 in the emotional self-regulation group, and 31.66 in the control group.

**Table 1**

*Means and Standard Deviations of Self-Compassion and Psychological Well-Being in the Experimental Groups (Positive Thinking Training and Emotional Self-Regulation Training) and Control Group at Pretest, Posttest, and Follow-Up*

Variable	Group	Pretest M (SD)	Posttest M (SD)	Follow-Up M (SD)
Self-Compassion	Positive Thinking Training	96.35 (7.46)	83.47 (10.78)	84.47 (10.07)
Self-Compassion	Emotional Self-Regulation	97.41 (11.67)	89.64 (14.75)	90.58 (14.07)
Self-Compassion	Control	98.44 (10.90)	99.33 (11.24)	99.33 (11.09)
Psychological Well-Being	Positive Thinking Training	31.35 (3.56)	42.65 (7.35)	42.18 (7.44)
Psychological Well-Being	Emotional Self-Regulation	32.71 (4.38)	43.76 (7.74)	43.41 (6.87)
Psychological Well-Being	Control	31.83 (3.16)	32.11 (1.64)	32.11 (2.49)

The descriptive findings presented in Table 1 indicate that both experimental groups demonstrated notable changes across the three measurement stages compared to the control group. In terms of self-compassion, the mean scores in both the positive thinking training group and the emotional self-regulation group showed substantial increases from pretest to posttest, and these improvements were maintained at the follow-up stage, whereas the control group exhibited

relatively stable scores with no meaningful change. Similarly, for psychological well-being, both experimental groups experienced considerable improvements from pretest to posttest, with the emotional self-regulation group showing slightly higher mean scores compared to the positive thinking group, and these gains persisted at follow-up. In contrast, the control group showed minimal variation across all three stages. Overall, the descriptive results suggest that

both interventions were effective in enhancing self-compassion and psychological well-being, with emotional self-regulation training demonstrating comparatively stronger improvements.

To ensure that the data met the underlying assumptions of covariance analysis, the assumptions of homogeneity of variances were examined. The results of the Kolmogorov–Smirnov test indicated that the variables of self-compassion and psychological well-being in the pretest, posttest, and follow-up stages across the three groups (experimental group 1, experimental group 2, and control group) had significance levels greater than 0.05; therefore, the assumption of normality was confirmed.

Levene’s test was conducted to assess the homogeneity of variances, and the results showed significance levels

greater than 0.05, confirming the homogeneity of variances. To examine the assumption of homogeneity of variance–covariance matrices between groups, Box’s M test was used. The results indicated that the significance levels obtained for the two variables, parenting stress (Box’s M = 56.05, F = 3.02, p = 0.023) and distress tolerance (Box’s M = 50.09, F = 3.08, p = 0.016), were greater than 0.05; therefore, the use of repeated measures analysis of variance (ANOVA) was appropriate.

To test the assumption of sphericity, Mauchly’s test was applied. The results indicated that the assumption of sphericity was satisfied for the research variables, including self-compassion (p = 0.12) and psychological well-being (p = 0.29).

**Table 2**

*Results of Repeated Measures ANOVA for Within-Group and Between-Group Effects of Positive Thinking Training and Emotional Self-Regulation Training on Self-Compassion and Psychological Well-Being*

Variable	Source	Sum of Squares	df	Mean Square	F	p	Effect Size	Power
Self-Compassion	Time	1369.49	2	684.74	97.55	0.001	0.66	1.00
Self-Compassion	Group	3185.91	2	1592.96	32.33	0.001	0.51	1.00
Self-Compassion	Time × Group	1055.13	4	263.78	37.58	0.001	0.60	1.00
Self-Compassion	Error	687.85	98	7.01	—	—	—	—
Psychological Well-Being	Time	1902.16	2	951.08	94.66	0.001	0.65	1.00
Psychological Well-Being	Group	1933.17	2	1933.17	20.30	0.001	0.46	1.00
Psychological Well-Being	Time × Group	898.33	4	224.58	22.35	0.001	0.47	1.00
Psychological Well-Being	Error	984.60	98	10.04	—	—	—	—

The results presented in Table 2 indicate that for self-compassion, there were significant effects of time, group, and the interaction between time and group (p = 0.001), suggesting that changes in self-compassion scores over the measurement stages differed significantly across groups. The effect sizes for time (0.66), group (0.51), and interaction (0.60) indicate large and meaningful effects, with statistical power equal to 1.00, reflecting high reliability of the findings. Similarly, for psychological well-being, significant

main effects of time and group, as well as a significant interaction effect between time and group (p = 0.001), were observed. The effect sizes (0.65 for time, 0.46 for group, and 0.47 for interaction) suggest moderate to large effects, again with maximum statistical power. Overall, these results demonstrate that both interventions had significant impacts on self-compassion and psychological well-being over time, and that the pattern of change differed significantly between the experimental and control groups.

**Table 3**

*Bonferroni Post Hoc Test for Pairwise Comparisons of Self-Compassion and Psychological Well-Being Across Time Points*

Variable	Phase A	Phase B	Mean Difference (A–B)	Standard Error	p
Self-Compassion	Pretest	Posttest	6.58	0.66	0.001
Self-Compassion	Pretest	Follow-Up	5.93	0.58	0.001
Self-Compassion	Posttest	Follow-Up	-0.64	0.16	0.19
Psychological Well-Being	Pretest	Posttest	-7.54	0.76	0.001
Psychological Well-Being	Pretest	Follow-Up	-7.26	0.69	0.001
Psychological Well-Being	Posttest	Follow-Up	0.27	0.32	0.69

The results of the Bonferroni post hoc test presented in Table 3 indicate that for self-compassion, there were significant differences between pretest and posttest, as well as between pretest and follow-up ( $p = 0.001$ ), demonstrating a substantial improvement over time; however, the difference between posttest and follow-up was not statistically significant ( $p = 0.19$ ), indicating stability of the intervention effects after the treatment period. Similarly, for psychological well-being, significant differences were

observed between pretest and posttest and between pretest and follow-up ( $p = 0.001$ ), reflecting notable improvements following the interventions; nevertheless, the difference between posttest and follow-up was not significant ( $p = 0.69$ ), suggesting that the gains achieved were maintained over time. Overall, these findings confirm the effectiveness of the interventions in improving both self-compassion and psychological well-being, with sustained effects at the follow-up stage.

**Table 4**

*Bonferroni Pairwise Comparisons of Experimental Groups and Control Group on Self-Compassion and Psychological Well-Being*

Variable	Group Comparison	Mean Difference (A-B)	Standard Error	p
Self-Compassion	Positive Thinking vs. Control	-15.86	2.31	0.001
Self-Compassion	Emotional Self-Regulation vs. Control	-9.69	2.45	0.001
Self-Compassion	Positive Thinking vs. Emotional Self-Regulation	-6.17	2.28	0.001
Psychological Well-Being	Positive Thinking vs. Control	10.54	1.98	0.001
Psychological Well-Being	Emotional Self-Regulation vs. Control	11.65	2.05	0.001
Psychological Well-Being	Positive Thinking vs. Emotional Self-Regulation	-1.11	1.92	0.04

The results of the Bonferroni pairwise comparisons presented in Table 4 indicate that both experimental interventions differed significantly from the control group in terms of self-compassion and psychological well-being ( $p = 0.001$ ). Specifically, both the positive thinking training group and the emotional self-regulation group showed significantly higher levels of self-compassion and psychological well-being compared to the control group, confirming the effectiveness of both interventions. Furthermore, a significant difference was observed between the two experimental groups in self-compassion, indicating that emotional self-regulation training produced greater improvements than positive thinking training. Similarly, although both interventions improved psychological well-being, the emotional self-regulation group demonstrated slightly higher outcomes than the positive thinking group, with this difference reaching statistical significance. Overall, these findings suggest that while both interventions are effective, emotional self-regulation training appears to be more impactful than positive thinking training in enhancing self-compassion and psychological well-being.

#### 4. Discussion

The present study aimed to compare the effectiveness of positive thinking training and emotional self-regulation training on self-compassion and psychological well-being among mothers of children with Autism Spectrum Disorder (ASD). The findings demonstrated that both interventions

led to significant improvements in self-compassion and psychological well-being across time, with effects maintained at the two-month follow-up. Additionally, the results revealed that emotional self-regulation training was more effective than positive thinking training in enhancing both self-compassion and psychological well-being. These findings provide empirical support for the effectiveness of both cognitive-oriented and emotion-focused interventions in improving mental health outcomes among mothers of children with ASD, while highlighting the comparatively stronger impact of emotional self-regulation approaches.

The significant increase in self-compassion observed in both experimental groups suggests that structured psychological interventions can effectively reduce self-critical tendencies and promote a more compassionate and accepting attitude toward oneself. This finding is consistent with theoretical models that conceptualize self-compassion as a modifiable construct influenced by cognitive and emotional processes (Anderson & Miller, 2024; Vidal et al., 2024). In particular, the improvement in self-compassion following emotional self-regulation training aligns with evidence indicating that adaptive emotion regulation strategies facilitate reduced emotional reactivity and increased self-kindness (Büyükoksüz & Kayaalp-pehlivan, 2025; Nguyen et al., 2025). Furthermore, previous research has demonstrated that self-compassion is closely associated with psychological resilience and serves as a buffer against stress and emotional distress, especially in high-demand

caregiving contexts (Huang et al., 2025; Kavehfarsani et al., 2020). Therefore, the observed improvements in self-compassion among participants in this study can be interpreted as a result of enhanced emotional awareness and regulation capacities, which reduce maladaptive self-judgment and foster a more supportive internal dialogue.

The findings also indicated that both interventions significantly improved psychological well-being, with sustained effects at follow-up. This result is consistent with previous studies showing that interventions targeting cognitive restructuring and emotional processes can enhance multiple dimensions of well-being, including autonomy, environmental mastery, and positive relationships (Wild et al., 2025). In the context of mothers of children with ASD, improvements in psychological well-being are particularly important, given the elevated levels of stress and emotional burden associated with caregiving responsibilities (Curtis & Izett, 2025; Martin et al., 2025). The current findings are in line with intervention-based studies demonstrating that psychological programs focusing on emotional and cognitive skills can significantly reduce distress and enhance well-being in this population (Xiang et al., 2025; Yan & Abdullah, 2025). Moreover, the maintenance of intervention effects at follow-up suggests that the skills acquired during the training sessions were internalized and applied in participants' daily lives, contributing to sustained psychological benefits.

The superior effectiveness of emotional self-regulation training compared to positive thinking training represents one of the key findings of this study. This result can be explained by the broader scope and deeper mechanisms targeted by emotional self-regulation interventions, which address not only cognitive processes but also emotional awareness, physiological responses, and behavioral patterns. According to transdiagnostic models of emotional disorders, deficits in emotion regulation are central to the development and maintenance of psychological difficulties, and interventions that directly target these processes are likely to produce more substantial and enduring effects (Matiz et al., 2025; Rehman et al., 2024). In contrast, positive thinking interventions primarily focus on modifying cognitive appraisals and promoting optimism, which, while beneficial, may not fully address underlying emotional dysregulation. This interpretation is supported by studies indicating that emotional regulation mediates the relationship between cognitive processes and mental health outcomes, thereby enhancing the effectiveness of interventions that incorporate

emotion-focused components (Fooladchang & Davoud, 2025; Rezagholiyan et al., 2025).

The greater effectiveness of emotional self-regulation training in improving self-compassion can also be understood in light of the close relationship between emotion regulation and self-compassion. Research has shown that individuals with higher levels of emotional regulation are better able to respond to personal distress with kindness and understanding rather than self-criticism (Nguyen et al., 2025; Vidal et al., 2024). Emotional regulation strategies such as cognitive reappraisal and mindfulness facilitate a balanced and non-reactive awareness of emotional experiences, which is a core component of self-compassion (Cutajar & Bates, 2025; Wild et al., 2025). Therefore, by enhancing participants' ability to regulate their emotions, the intervention likely created a psychological context conducive to the development of self-compassion.

Similarly, the stronger impact of emotional self-regulation training on psychological well-being can be attributed to its comprehensive approach to emotional functioning. Emotional regulation training equips individuals with skills to manage negative emotions, reduce maladaptive coping strategies such as avoidance, and increase adaptive responses such as acceptance and reappraisal. These processes are directly linked to improved well-being and reduced psychological distress (Matiz et al., 2025; Rehman et al., 2024). In contrast, while positive thinking promotes optimism and positive appraisal, it may be less effective in situations where individuals experience intense or persistent negative emotions, as is often the case for mothers of children with ASD. This distinction highlights the importance of addressing both cognitive and emotional dimensions in psychological interventions.

The effectiveness of positive thinking training observed in this study is also consistent with previous research demonstrating the benefits of optimism-based interventions in enhancing well-being and reducing distress. Positive thinking has been shown to improve cognitive flexibility, increase positive affect, and promote adaptive coping strategies (Basurrah et al., 2023; Saghebi et al., 2020). Additionally, optimism and positive cognitive styles have been identified as mediators in the relationship between self-compassion and psychological outcomes, suggesting that positive thinking can indirectly contribute to improved mental health (Golestani Bakht et al., 2022; Uzun & Karataş, 2023). The present findings support the role of positive thinking as an effective intervention, albeit less powerful than emotional self-regulation training.

Another important finding of the study is the stability of intervention effects over time, as indicated by the non-significant differences between posttest and follow-up measurements. This suggests that both interventions produced lasting changes in participants' cognitive and emotional processes, which were maintained beyond the intervention period. This finding is consistent with previous studies indicating that skills acquired through structured psychological interventions, such as emotion regulation and positive thinking, can lead to enduring improvements in mental health (Matiz et al., 2025; Shapira & Mongrain, 2010). The durability of these effects is particularly important in the context of chronic stressors, such as caregiving for a child with ASD, where ongoing psychological resources are essential for maintaining well-being.

## 5. Conclusion

Overall, the findings of this study contribute to the growing body of literature on the role of self-compassion and emotional regulation in mental health and provide evidence for the effectiveness of targeted interventions in improving psychological outcomes among mothers of children with ASD. The results underscore the importance of addressing both cognitive and emotional processes in intervention design and highlight the potential of emotional self-regulation training as a particularly effective approach for enhancing self-compassion and psychological well-being.

One of the main limitations of the present study is the relatively small sample size, which may limit the generalizability of the findings to broader populations. Additionally, the use of purposive sampling and the focus on a specific geographic location may restrict the external validity of the results. Another limitation is the reliance on self-report measures, which may be subject to response biases such as social desirability. Furthermore, the follow-up period was limited to two months, and longer-term effects of the interventions were not assessed. The study also did not control for potential confounding variables such as socioeconomic status, severity of the child's condition, or access to social support, which could influence the outcomes.

Future research should aim to replicate these findings using larger and more diverse samples to enhance generalizability. Longitudinal studies with extended follow-up periods are recommended to examine the long-term

sustainability of intervention effects. Additionally, future studies could explore the integration of positive thinking and emotional self-regulation approaches to develop more comprehensive intervention programs. Investigating the moderating role of variables such as social support, cultural context, and individual differences in personality traits could also provide valuable insights. Moreover, the use of mixed-methods designs incorporating qualitative data could help to better understand participants' experiences and the mechanisms underlying intervention effectiveness.

From a practical perspective, the findings of this study suggest that mental health professionals working with mothers of children with ASD should prioritize interventions that target emotional self-regulation skills. Training programs that enhance emotional awareness, cognitive flexibility, and adaptive coping strategies can play a crucial role in improving psychological well-being and self-compassion in this population. Incorporating elements of positive thinking may further enhance intervention outcomes by promoting optimism and positive cognitive patterns. It is also recommended that such interventions be delivered in group formats to facilitate social support and shared experiences among participants. Finally, policymakers and healthcare providers should consider integrating these evidence-based interventions into support services for families of children with ASD to improve overall family well-being.

## 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

Data are available for research purposes upon reasonable request to the corresponding author.

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## Declaration of Interest

The authors report no conflict 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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